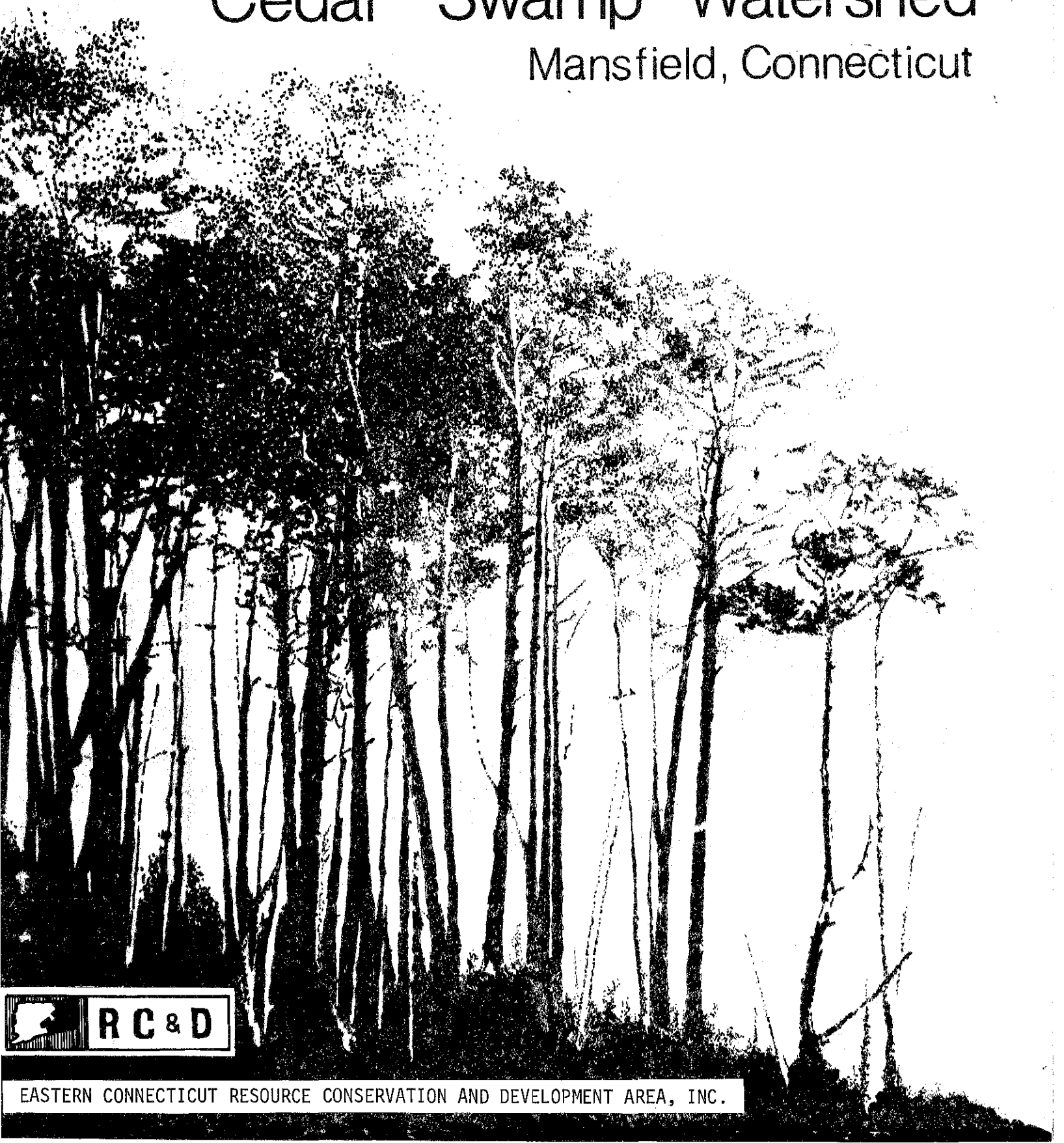
Environmental Review Team Report

Cedar Swamp Watershed

Mansfield, Connecticut



RC&D

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

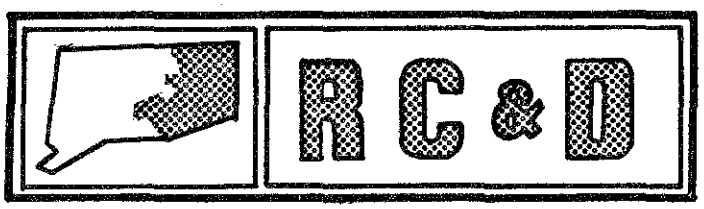
Environmental Review Team Report

on

Cedar Swamp Watershed

Mansfield, Connecticut

March 1980

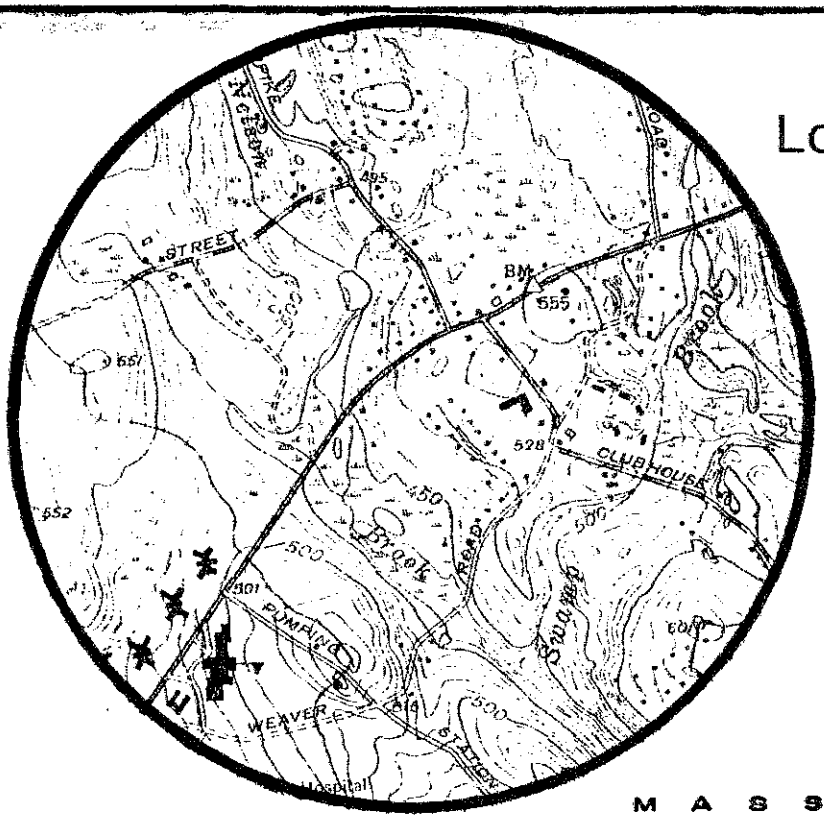


eastern connecticut resource conservation & development area

environmental review team
139 boswell avenue
norwich, connecticut 06360

Location of Study Site

CEDAR SWAMP BROOK WATERSHED
MANSFIELD, CONNECTICUT



EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
CEDAR SWAMP BROOK WATERSHED
MANSFIELD, CONNECTICUT

This report is an outgrowth of a request from the Mansfield Conservation Commission, to the Tolland County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Area Executive Committee for their consideration and approval as a project measure. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The soils of the site were mapped by a soil scientist of the United States Department of Agriculture (USDA), Soil Conservation Service (SCS). Reproductions of the soil survey map as well as a topographic map of the site were distributed to all ERT participants prior to their field review of the site.

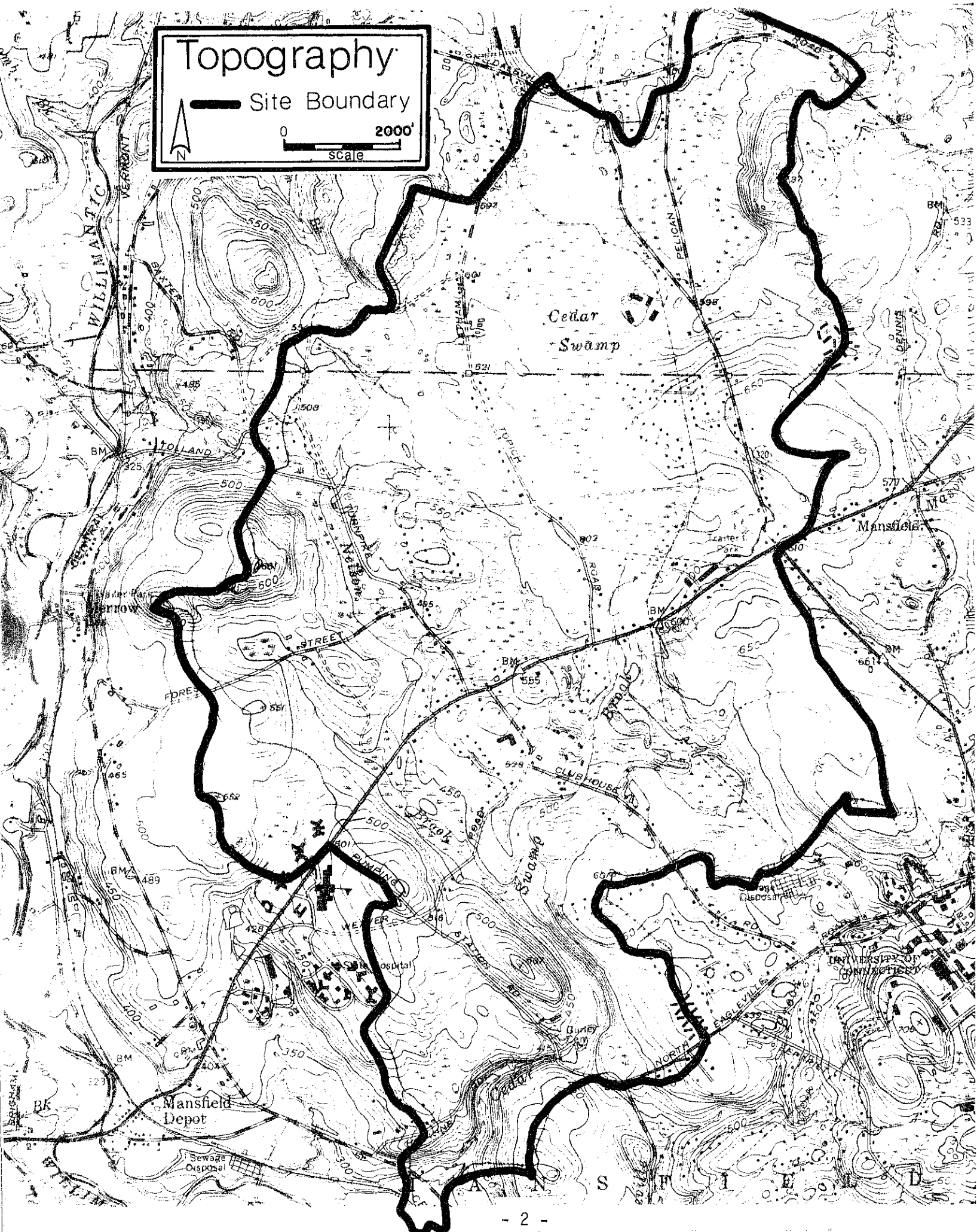
The ERT that field checked the site consisted of the following personnel: Tim Dodge, District Conservationist, SCS; Tom Ladny, Soil Conservationist, SCS; Mike Zizka, Geologist, Department of Environmental Protection (DEP); Rob Rocks, Forester, DEP; Marian Storch, Sanitarian, State Department of Health; Les Barber, Regional Planner, Windham Regional Planning Agency; Allan Williams, Wetlands Ecologist, DEP; Chuck Phillips, Fisheries Biologist, DEP; Joe Risigo, Wildlife Biologist, DEP; Andy Petracco, Recreation Specialist, DEP; and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field-checked the site on Thursday, May 17, 1979. Reports from each Team member were sent to the ERT Coordinator for review and summarization for the final report.

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to any proposed development and also suggests considerations that should be of concern to the potential developer and the Town of Mansfield. The results of this Team action are oriented toward the development of a better environmental quality and the long-term economics of the land use.

The Eastern Connecticut RC&D Project Committee hopes you will find this report of value and assistance in making your decisions on this particular site.

If you require any additional information, please contact: Ms. Jeanne Shelburn, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360, 889-2324.


Topography
Site Boundary
0
2000'
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N
Cedar
Swamp
Mansfield
Mansfield
Depot
Sewage
Disposal
Storrs
Hospital
Burley
Dam
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Brook
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WILLIMANTIC
VERMONT
BAXTER
PELICAN
LEITHAM
DENNIS
TOLLAND
TURNPIKE
NORTH
STREET
CLUBHOUSE
ROAD
PUMPING
STATION
EAGLEVILLE
UNIVERSITY OF
CONNECTICUT
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M A N S F I E L D

INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare a natural resource inventory of the Cedar Swamp Brook Watershed for the Mansfield Conservation Commission. The study area is located in the northwest section of the town and does extend slightly into the southern section of the Town of Willington. The major portion of the watershed extends south from Daleville Road in Willington to Route 32 near the village of Eagleville in Mansfield.

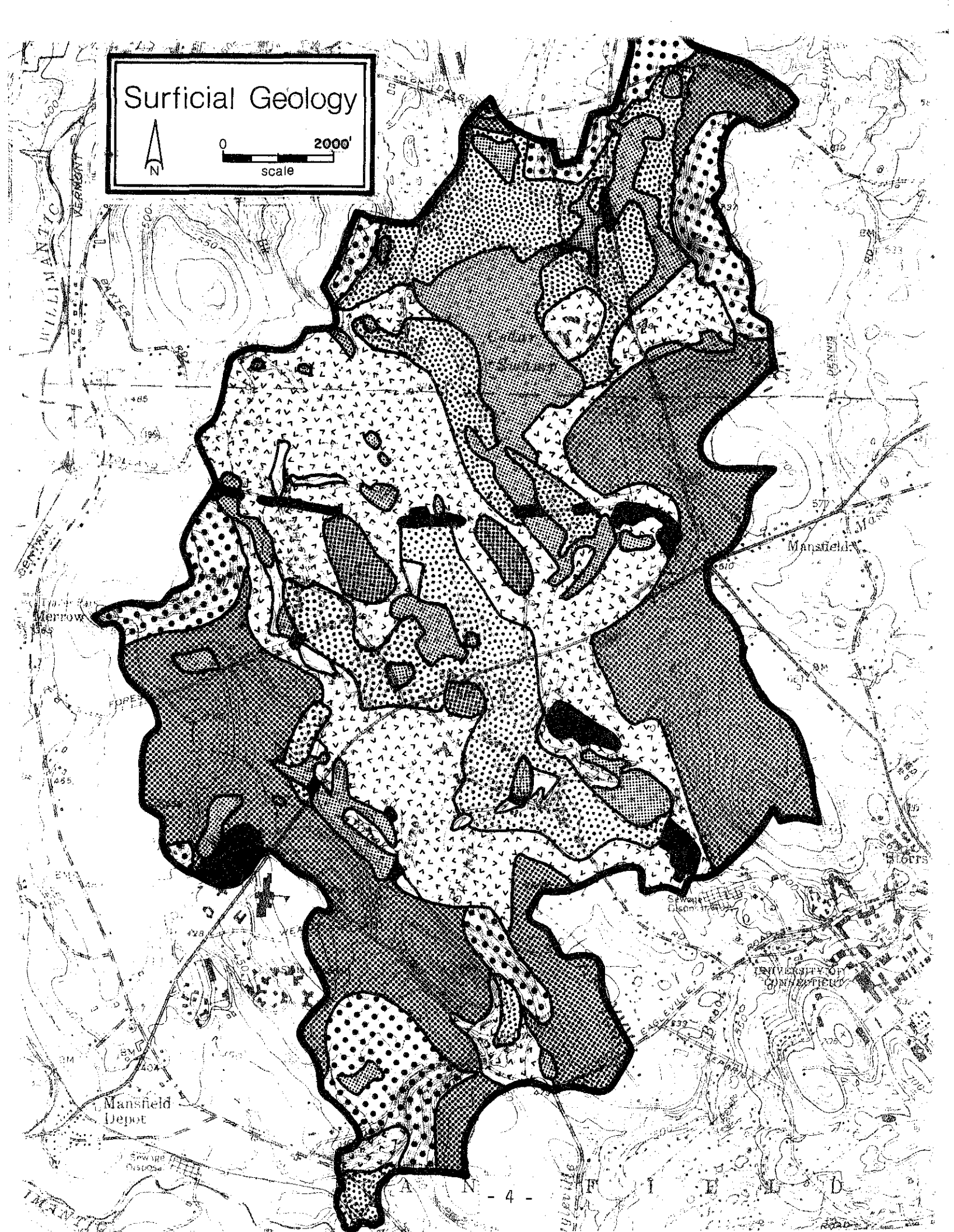
Prior to this study the Commission had identified the Cedar Swamp Brook/ Nelson Brook area as one of the important streambelts in Mansfield. Several large wetlands associated with the brook remain relatively unspoiled. The Commission was concerned with the location and quality of aquifers in the watershed, as well as recreation potential and quality of wildlife habitat. There were some indications that this area may come under some development pressure in the near future. The Commission hopes to present management recommendations to the Mansfield Planning and Zoning Commission, outlining areas of potential threats to the streambelt and suggestions for proper regulation, based on information presented in this report. The Team has attempted to identify areas of environmental sensitivity and areas best suited for development, as well as an inventory of the natural resource base of the watershed.

NATURAL RESOURCE INVENTORY

SURFICIAL GEOLOGY

The surficial geologic materials in the Cedar Swamp Brook watershed (those unconsolidated materials overlying bedrock) may be broadly classified into four major units: till, stratified drift, alluvium, and swamp sediments. Till is a nonsorted, nonstratified deposit of glacial debris that is composed largely of rock particles with widely ranging shapes and sizes. The debris accumulated on, within, or beneath an ice sheet as it moved across preexisting soils and rock outcrops; it was later deposited directly from the ice without substantial reworking by meltwater. Till is generally observed in one of two forms in this area: a sandy, friable, very stony variety that forms the surficial deposit in most parts of the watershed, and a silty, compact variety that generally underlies the sandier till at depths of 10 feet or less. Stratified drift comprises those materials that were deposited by meltwater streams, generally (in this area) in contact with wasting ice. Stratified drift is composed primarily of sand and gravel. Alluvium consists of sand, gravel, and silt that were deposited by modern streams on floodplains or in channels. Swamp sediments consist of sand, silt, clay, and organic remains that were deposited in stagnant or slow-moving, well-vegetated bodies of water.

Figure 1, adapted from a surficial geologic map of the South Coventry quadrangle, by Larry Frankel (1968), shows the approximate distribution of the various surficial units in the watershed. Figure 1A shows the location of bedrock outcrops in the watershed, as adapted from a bedrock outcrop map of the South Coventry quadrangle by R.J. Fahey and M.H. Pease, Jr. (1977). Both quadrangle maps are available for inspection at the Natural Resources Center, DEP, in Hartford.


Surficial Geology
N
0
2000'
scale
Mansfield
Depot
Storrs
UNIVERSITY OF
CONNECTICUT

LEGEND - SURFICIAL GEOLOGY

Till, generally more than 9 feet thick.

Till, generally less than 9 feet thick.

Stratified drift, generally greater than 9 feet thick.

Stratified drift, generally less than 9 feet thick.

Alluvial deposits.

Swamp deposits.

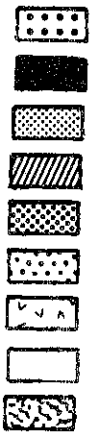
Artificial fill.

LEGEND - BEDROCK OUTCROPS

Individual bedrock outcrops.

Areas of numerous small outcrops.

LEGEND - BEDROCK GEOLOGY



Bigelow Brook Formation.

Diabase dike.

Diorite.

Hamilton Reservoir Formation, Lower Gneiss Member.

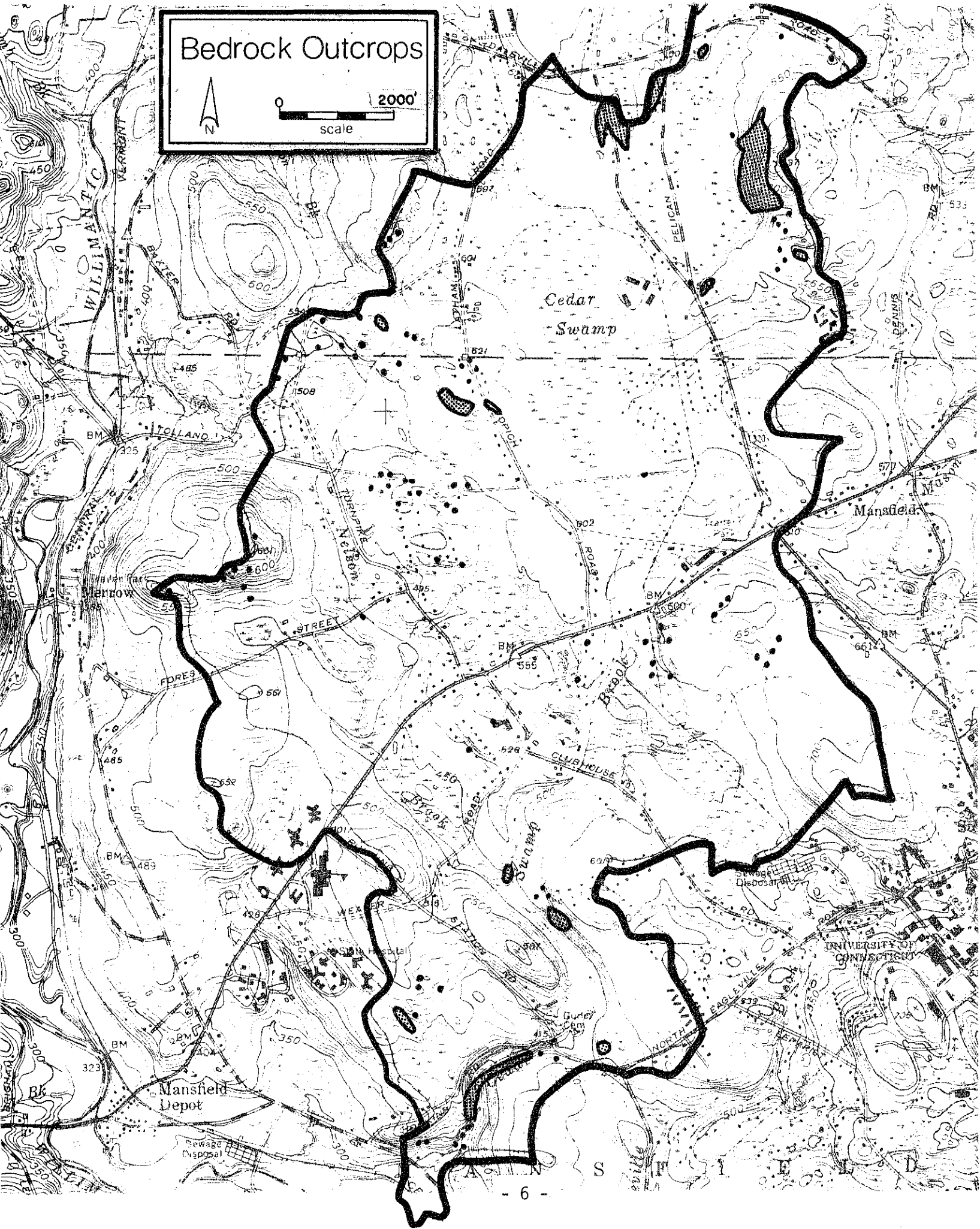
Hamilton Reservoir Formation, Lower Schist Member.

Hamilton Reservoir Formation, Sulfidic Schist.

Southbridge Formation.

Southbridge Formation, Aluminous Schist.

Southbridge Formation, Calcium-Silicate Gneiss.


Bedrock Outcrops
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Cedar
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Merrow
TOLLAND
STORRS
WILLIMANTIC
VERMONT
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PELICAN
DENNIS
TOPICH
TURNPIKE
NELSON
ROAD
STREET
FORES
BROOK
CLUBHOUSE
SWAMP
BATTEN
NORTH
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Sewage
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Disposal
Gurley
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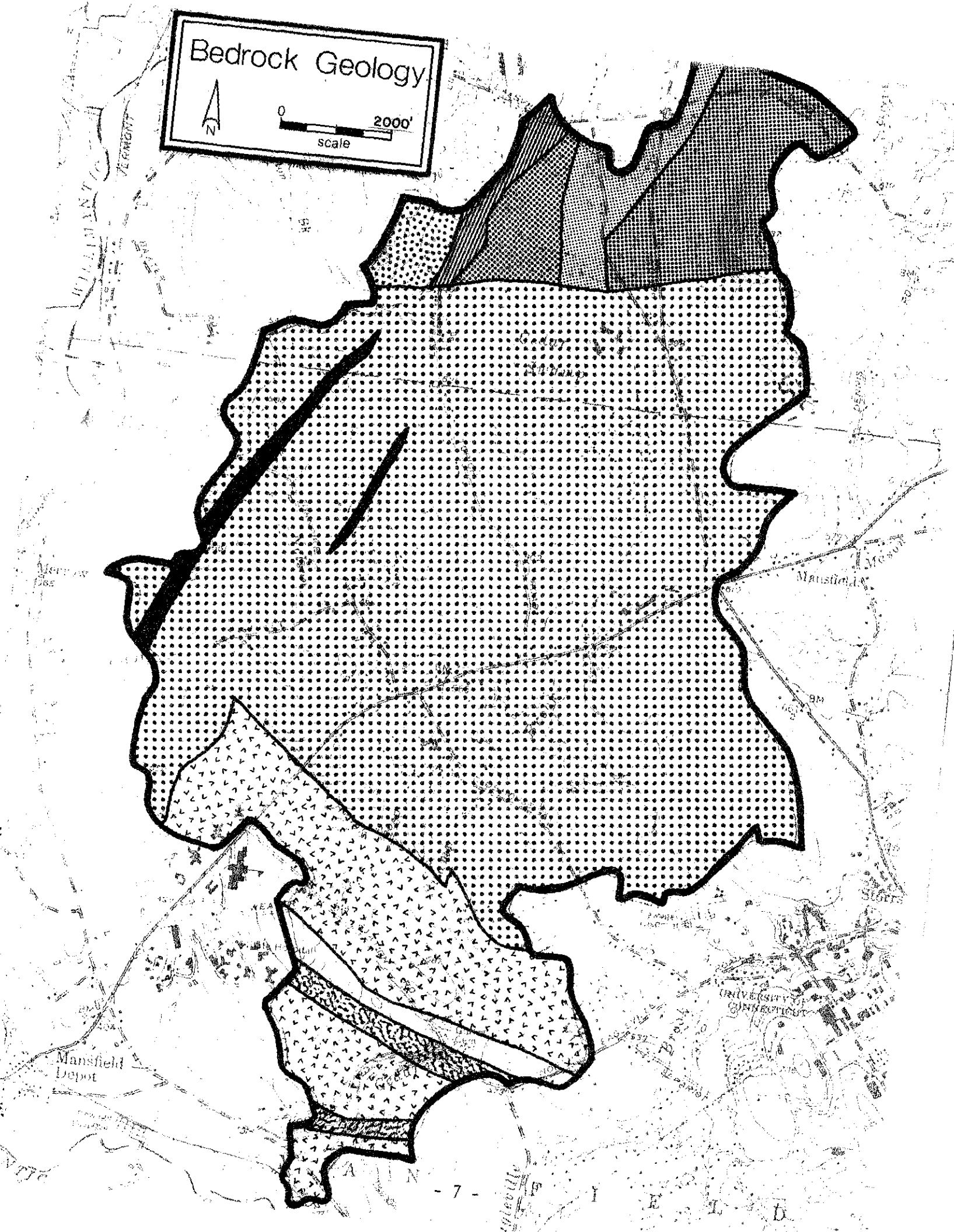
Bedrock Geology
N
0
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scale
Mansfield
Mansfield Depot

BEDROCK GEOLOGY

The bedrock geology of the South Coventry quadrangle has been mapped and described by R.J. Fahey and M.H. Pease, Jr. (1977). The map and report are open-filed at the Natural Resources Center, DEP, in Hartford. Those units cropping out in or underlying the Cedar Swamp Brook watershed are shown in Figure 2. A brief description of these units follows. In the description, the term "gneiss" refers to crystalline rocks in which platy or elongate minerals alternate in thin layers with more rounded minerals. "Diabase" and "diorite" are terms referring to rocks which formed directly from a molten state and which have certain characteristic mineral components (listed below).

Bigelow Brook Formation: Composed mostly of gray weathering, fine- to medium-grained schist and gneiss. Important minerals are quartz, feldspar, biotite, garnet, and sillimanite. Unit includes conspicuous layers of amphibolite and calcium-silicate-bearing granular schist.

Diabase dike: Greenish gray to dark gray, fine-grained rock containing the minerals labradorite, augite, hypersthene, and magnetite.

Diorite: Weakly layered, medium- to coarse-grained, grayish-brown to dark-dray-weathering rock containing the minerals quartz, sodic plagioclase, biotite, hornblende, and orthopyroxene.

Hamilton Reservoir Formation, Lower Gneiss Member: Predominantly thinly layered, fine-grained, granular, light brownish gray to olive brown, biotite schist, interlayered with medium-grained, light to dark gray gneiss composed primarily of quartz, oligoclase, and biotite.

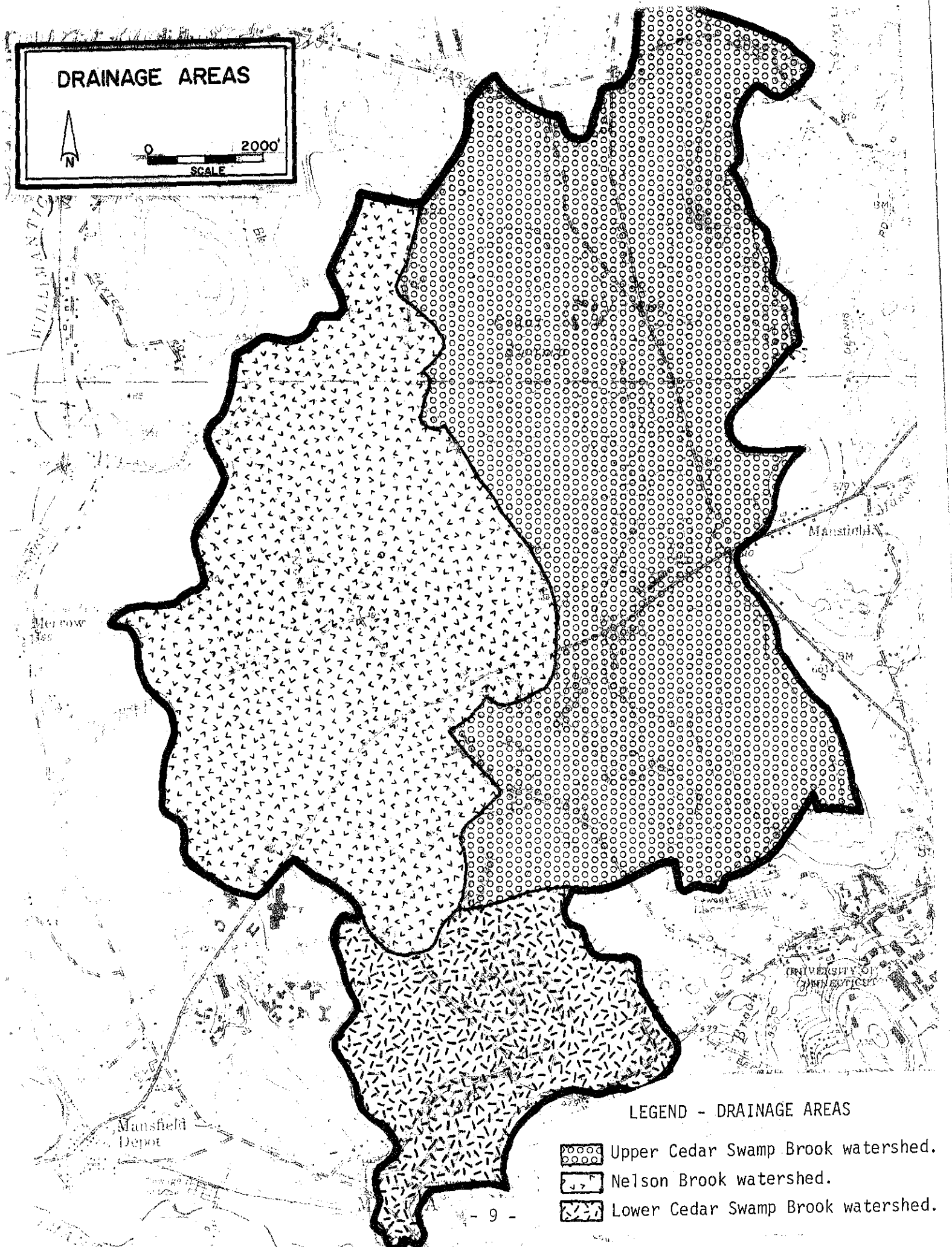
Hamilton Reservoir Formation, Lower Schist Member: Upper two-thirds is chiefly rusty-brown to reddish-orange-weathering gneiss and schist composed of quartz, oligoclase, garnet, biotite, and sillimanite. Felsic gneiss and sulfidic schist layers are common. Lower third is chiefly reddish-orange-weathering felsic gneiss.

Hamilton Reservoir Formation, Sulfidic Schist: A lens of rusty-brown-weathering, medium-grained schist containing quartz, felspar, biotite, garnet, graphite, and sulfide minerals.

Southbridge Formation: Mostly medium-grained, light gray to greenish gray, well-bedded schist composed primarily of quartz, plagioclase, and biotite.

Southbridge Formation, Aluminous Schist: Medium-grained, reddish-orange to gray-weathering gneiss composed of quartz, plagioclase, biotite, garnet, and sillimanite, interlayered with rusty brown to yellowish-orange-weathering sulfidic graphite schist.

Southbridge Formation, Calcium-Silicate Gneiss: Well-layered, greenish-gray amphibolite gneiss, occasionally interlayered with biotite schist.


DRAINAGE AREAS
N
2000'
SCALE
Mansfield
Mansfield Depot
UNIVERSITY OF CONNECTICUT
LEGEND - DRAINAGE AREAS
Upper Cedar Swamp Brook watershed.
Nelson Brook watershed.
Lower Cedar Swamp Brook watershed.

HYDROLOGY

The watershed of Cedar Swamp Brook may be defined as the area that includes all land from which runoff ultimately drains into the brook. Figure 2 shows the approximate extent of the watershed, which, for convenience, has been divided into three smaller units. The watershed boundaries shown may not account for possible drainage rerouting through man-made structures.

The watershed of Nelson Brook, a tributary of Cedar Swamp Brook, comprises approximately 1,200 acres, or 1.9 square miles. Nelson Brook itself is approximately 2.5 miles long and has numerous smaller tributaries. Wetland areas are located in the headwater regions of most of the tributaries, and many wetlands are scattered along the brook itself. The relief of the Nelson Brook watershed (the range of topographic elevations) is low in the northern section and moderate in the southern section.

The watershed area of Cedar Swamp Brook lying north of its confluence with Nelson Brook comprises approximately 1,680 acres, or 2.7 square miles. This section contains the extensive, continuous wetland that gives the brook its name. Relief is generally low, a characteristic of the sand and gravel deposits that make up most of this area; nevertheless, this section contains the highest point within the overall watershed: 733 feet at the northwest corner of the North Eagleville Road cemetery at UConn. The UConn landfill also lies within this area.

The watershed area of Cedar Swamp Brook lying south of its confluence with Nelson Brook consists of only about 0.7 square mile, or 440 acres. This area has the greatest relief in the overall watershed: the brook forms a scenic ravine in this section. Although apartment complexes are located along the boundary, this section has remained relatively free from development because of the steep slopes.

Streamflow records from a gaging station on Cedar Swamp Brook at Route 32 indicate that flow in the brook has occasionally dropped as low as 0.1 cubic foot per second (source: Connecticut Water Resources Bulletin No. 12). An analysis of the overall watershed, using a method formulated by L.A. Weiss of the U.S. Geological Survey, indicates that flow at the mouth of the brook may be as high as 1575 cfs during a 100-year-recurrence, 24-hour-duration storm event. The latter figure assumes a completely non-sewered watershed.

SOILS

A detailed soils map of this site is included in the Appendix to this report, accompanied by a chart which indicates soil limitations for various urban uses. As the soil map is an enlargement from the original 1,320'/inch scale to 2,000'/inch, the soil boundary lines should not be viewed as absolute boundaries, but as guidelines to the distribution of soil types of the site. The soil limitation chart indicates the probable limitations for each of the soils for on-site sewage disposal, buildings with basement, streets and parking, landscaping, camp sites, picnic areas, playgrounds and trails and paths. However, limitations, even though severe, do not preclude the use of the land for development. If economics permit large expenditures for land development and the intended objective is consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used. The soils map, within the publication Soil Survey: Tolland County, Connecticut, can aid in the identification and interpretations of

soils and their uses on this site. Know Your Land: Natural Soil Groups for Connecticut can also give insight to the development potentials of the soils and their relationship to the surficial geology of the site. Soils information is presented for the entire watershed, which includes land in the towns of Willington and Mansfield, and soils information is also presented for a subwatershed. This smaller watershed lies entirely in Mansfield and it was the subject of closer scrutiny than the complete watershed.

The entire Cedar Swamp Brook Watershed comprises 3,106 acres. Of this area, approximately 2,201 acres or 71% have severe limitations for development. The principal limiting factors include wetness, slope, large stones and shallow depth to bedrock. Soils representative of the watershed area include the Charlton series, the Hinckley series, the Hollis series, the Leicester-Ridgebury-Whitman complex, the Merrimac series, the Paxton series, Peat and Muck, the Sutton series, and the Woodbridge series. For a breakdown of all soil types in the entire watershed and their limitations, see the Appendix.

The Nelson Brook subwatershed, lying entirely in Mansfield, comprises 1,019 acres. Of this area, approximately 812 acres or 80% have severe limitations for development. The principal limiting factors are the same as in the previous paragraph. The dominant soils include: Charlton series, the Hollis series, the Leicester-Ridgebury-Whitman complex, Peat and Muck and the Sutton series.

Soil Descriptions

Charlton Series: These soils are deep well-drained and have formed in friable glacial till. Charlton soils are moderately permeable and have a high moisture-holding capacity. The principal limiting factor to development is slope exceeding 8%. Stony phases of this soil are common. Non-stony areas with slopes not exceeding 8% are considered prime farmlands.

Hinckley Series: These soils are somewhat excessively drained and have formed in water-sorted material. Principal limiting factors are droughtiness and slope, which pose moderate limitations for development. Non-stony areas with slopes not exceeding 8% are considered prime farmlands.

Hollis Series: The Hollis series consists of a shallow, well-drained to excessively well-drained soil formed in acid glacial till from schist and gneiss. Depth to bedrock averages 10 to 20 inches. This soil has severe limitations to development, including foundation excavation and on-site septic disposal. However, it is possible to find pockets of soil which may exceed 10 feet in depth. If these locations can be identified, septic and other development activities may be constructed with little difficulty.

Leicester-Ridgebury-Whitman Complex: This mapping unit is made up of poorly drained Leicester and Ridgebury and very poorly drained Whitman soils. All of these soils are wet and very stony and are regulated under Public Act 155 as amended, which protects inland wetlands.

Merrimac Series: These soils are well-drained to somewhat excessively drained and occur in nearly level to gently sloping areas. Merrimac soils overlie stratified sand and gravel and have few limitations for development. Merrimac soils are considered prime farmlands.

Paxton Series: These soils are well-drained and have formed in compact glacial till. They have a hard compact layer starting at a depth of 16 to 30 inches, which creates a seasonal high water table. This seasonal wetness causes severe limitations for septic field disposal of waste. Slope and large stones also cause severe limitations for development. Paxton soils on slopes not exceeding 8% and under non-stony conditions are considered prime farmlands.

Peat and Muck: These soils consists of organic deposits in swamps and bogs. They are regulated wetlands under Public Act 155 as amended.

Sutton Series: These soils are moderately well-drained and were formed over compact glacial till. They have seasonally high water tables which cause severe limitations to septic field disposal and for dwellings with basements. Areas with less than 8% slope and few stones are considered prime farmland.

Woodbridge Series: These soils are moderately well-drained and have formed in compact glacial till. They have a hard compact layer starting at a depth of 20 to 30 inches, which creates a seasonally high water table. Due to the high water table, severe limitations exist for septic field disposal and for dwellings with basements. Large stones and steepness of slope are also severe limitations to development. Areas with less than 8% slope and few stones are considered prime farmland.

WETLAND RESOURCES

The Cedar Swamp Brook Watershed generally runs in a north/south orientation, but is transected by a series of east/west local and state roads. As a consequence, the wetland types are different just upstream and just downstream of these road crossings. In general, the roads and their culverts have acted to backwater the north sides, and to cause a slightly drier ground water regime on the south sides. The damming affect also causes sediment buildup to the north of roadways evidenced by deep peat and muck deposits, and results in the water being less turbid, and the water course channel more gravelly, just south of these roadways.

As a result there are more emergent plant species in the areas just north of the roadways, and a tendency to have at least a small red maple swamp south of the roadway crossings. It is also possible that some of the Cedar Swamp Brook wetland was once grazed or plowed fields (this appears to be the case on 1934 air photographs) which have reverted to or become wetlands; if this is true the acreage of wetland has grown and may be still growing. As the roadways continue to dam the system, it can be expected to cause the wetland to elevate slightly unless there are changes in the roadway elevations or culvert sizes.

The wetland is composed of the following classes: wooded swamp, shrub swamp, meadow and open water. (See Appendix for more detailed field sheets.)

The wooded swamps are dominated by red maple, although they also contain numerous poison sumacs. Nearly every maple is growing out of tussocks dominated by tussock sedge.

The shrub swamps are dominated by red maple saplings, alders, and dogwoods. A very large concentration of poison sumac is found in the sections north of Forest Street. Poison sumac is also liberally sprinkled through the other areas.

Meadow type wetlands are found in several patches where water fluctuations or lack of time since field abandonment prevents a wooded succession. Meadow emergents such as tussock sedge are prevalent.

Open water areas are few and have very little vegetation. Manmade ponds or dugouts provide most of the open water.

Generally the Cedar Swamp Brook wetland system is not unique among Connecticut's wetlands, but it still has important values: it is floristically diverse; is large enough to provide protection for small mammals and songbirds; it does have some uncommon (though not rare or endangered) plant species (bottle gentians, small purple fringed orchid); and it is probably helping to maintain good water quality in Cedar Swamp Brook (and concurrently, in the Willimantic River).

In general, though, the flora is not of unusually high quantity or quality, or the type that is particularly infrequent in occurrence.

The wetland classes and subclasses are all very common; there appeared to be no particular flora at the limits of its range; the juxtaposition of several seral stages appears to be minor and of no significant educational value; waterfowl production is nearly nonexistent; it lacks several important wetland classes which would make the site more attractive to migrating waterfowl and marsh birds; and there appear to be no outstanding geomorphological features associated with the wetland.

If there was a large body of open water coupled with a significant area of deep or shallow marsh, however, the value of the site would be extremely high. In their absence, the site can only be rated as moderate in value.

The value of the wetland would also be significantly increased if it were determined to have important flood retention qualities.

Should development occur on the adjacent upland, the wetland value would, again, increase. The value for wildlife would not decline, although the number of species might, due to human activities. The importance of the wetland as a sediment filter and nutrient trap (or exchange) would most likely increase.

The wetlands are not underlain by any significant quantities of stratified deposits, and hence are unlikely candidates for large quantity ground water extraction.

There are no public recreational facilities, and limited areas of recreational potential in the wetlands.

The water course may be too small and too detritus-laden to canoe or paddle, there are few fish suitable for fishing, waterfowl potential is minor, and the terrain is often too difficult for the casual nature hiker. Small privately owned ponds provide some recreational value to their owners.

The only evidence of pollution exists at the Route 44A DOT storage site where fill and leachate entering the sapling swamp has caused a burnout of some shrubs, and their partial replacement of species adaptable to salt and disturbance; cattails and phragmites. This situation has been reported to the Water Resources Unit of DEP, which has taken steps to ameliorate the problem.

In conclusion, the Cedar Swamp Brook Wetlands are relatively pollution-free, and provide a moderate amount of wildlife value. In addition, water quality leaving the wetlands is probably quite high. However, the wetland is not unique among wetland types and possesses no special features worthy of special protection. However, because this wetland, if left intact may provide a good buffer against negative stream impacts, it should be protected as much as possible. Also, an important consideration in determining the value of this system is its ability to store flood waters. Flood water storage in a natural basin like the Cedar Swamp Brook Wetland system should be encouraged. Conversely, incremental loss of this storage capability should be prevented, especially if the cumulative result of such losses were to lead to expensive flood control projects. In the absence of flood storage information, however, the value of these wetlands remains in the moderate class.

FOREST RESOURCES

The 3,320± acre Cedar Swamp Brook watershed is located in the towns of Mansfield and Willington. Several vegetation types are present within this watershed; they are described below.

The mixed hardwood type is most widespread, and would respond well to forest management practices.

The inland wetlands present within this watershed are extensive and contain fragile plant communities, which may be negatively affected or lost by careless development.

The adoption of town ordinances to regulate timber harvesting practices should be considered to guard against improper practices which may cause negative impact on the environment.

Vegetation Descriptions: See vegetation and land use map.

Mixed Hardwoods. 1,316 acres or 39.6% of the 3,320 acre Cedar Swamp Brook watershed is vegetated by mixed hardwoods. The main constituents of the overstory in this forest type are white oak, black oak, red oak, shagbark hickory, pignut hickory, mockernut hickory, black birch, yellow birch, red maple, and sugar maple.

The condition of the trees in the overstory is quite variable, as dictated by site conditions, past land use, and past vegetation management.

Understory vegetation is variable; however, the presence of hardwood tree seedlings and maple-leaf viburnum is consistent throughout. Much of this forest type would respond well to forest management.

Inland Wetland. Approximately 779 acres or 23.5% of the Cedar Swamp Brook watershed is designated as inland wetland. This designation is based on poorly drained, very poorly drained, alluvial, and floodplain soil classifications. There are a variety of wetland vegetation types present. They range from hardwood swamps to open marshes. The hardwood swamp type is usually dominated by crowded, poor-quality red maple in the overstory with a dense growth of viburnum, highbush blueberry, speckled alder, sweet pepperbush, or spicebush in the understory. Ground cover is primarily made up of skunk cabbage, tussock sedge, and assorted ferns.

Fifty acres of Cedar Swamp is vegetated by sapling size hemlock and blackgum with larger trees along the edges. This dense overstory has precluded most understory and ground cover vegetation in this area except for sphagnum moss and occasional wetland wild flowers.

The open-water swamp areas are dominated by shrub species such as speckled alder, button bush, and swamp loose-strife, while soft-stemmed plants including sedges, cattails, and rushes are present in the open marsh areas.

In several areas, the water table has been permanently raised by restrictions of water flow through inadequate culverts. This has resulted in partial, and in some instances complete, destruction of the red maple overstory in some hardwood swamp areas. In these areas the understory shrub vegetation has become dominant and the vegetation is in the process of changing to an open swamp type.

Residential/Commercial. Approximately 479 acres or 14.4% of this watershed has been subdivided into residential or commercial lots. The acreage of roads through these areas has been tallied with the lots. Forest management is generally limited, as a result of small lot sizes.

Agricultural Lands/Open Fields. 377 acres or 11.4% of the total watershed is either utilized for the production of crops, including corn, vegetables and hay, grazed by livestock, or left idle.

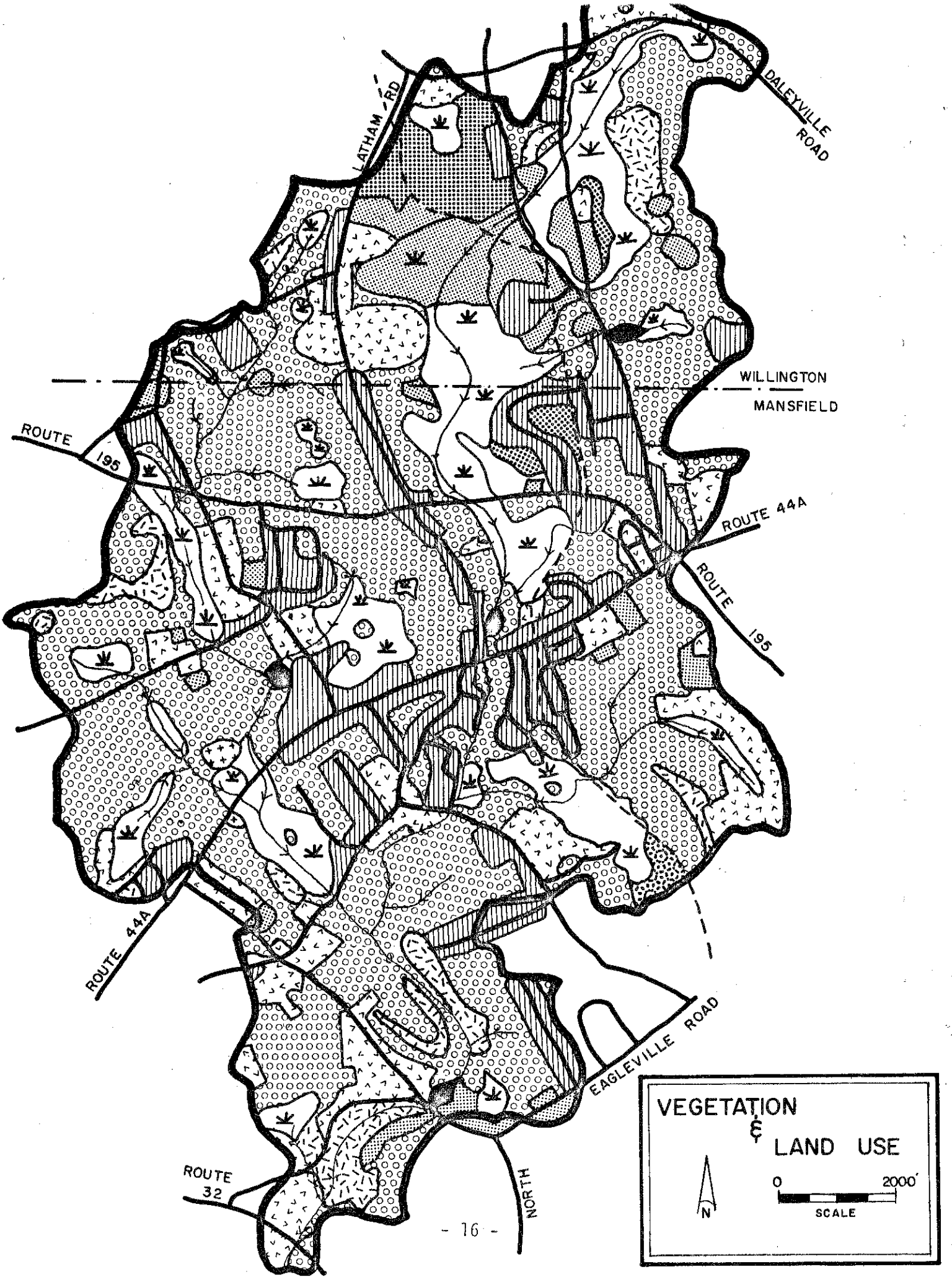
Softwoods. Softwoods comprise approximately 128 acres or 3.8% of this watershed. In this vegetation category both plantations and natural stands of conifers have been combined. This vegetation type excludes the hemlock stand present in Cedar Swamp.

The softwood plantations are usually plantings of eastern white pine, Norway spruce, and red pine or a combination of these species planted on abandoned agricultural land. The majority of these plantations are overcrowded and lack substantial understory and ground cover vegetation.

The natural stands are predominantly eastern white pine or hemlock with scattered pitch pine on the droughtiest sites. Understory vegetation is dominated by softwood tree seedlings, lowbush blueberry, and huckleberry on the driest sites, with viburnum, highbush blueberry, sweet pepperbush, and spicebush dominating the poorly drained softwood sites.

Softwoods/Hardwoods. 109 acres or 3.2% of the watershed is vegetated with a mixture of softwoods and hardwoods. Eastern white pine and hemlock are the dominant softwood species present. White oak, black oak, pignut hickory, mockernut hickory, and black birch are the most numerous hardwood tree species present. Understory vegetation is made up of witch-hazel, mapleleaf viburnum, softwood tree seedlings, and to a lesser extent hardwood tree seedlings. Ground-cover vegetation consists of grasses, lowbush blueberry, huckleberry, and club moss.

Disturbed Land. 20 acres or approximately .6% of this watershed has had the topsoil removed or disturbed, leaving barren mineral soil. Pioneer plant species such as aspen, gray birch, willow, cherry, sweet fern, bayberry, raspberry, grasses, goldenrod, and assorted other weed species have become established.


LATHAM RD.
DALEYVILLE ROAD
WILLINGTON
MANSFIELD
ROUTE 195
ROUTE 44A
ROUTE 195
ROUTE 44A
EAGLEVILLE ROAD
ROUTE 32
NORTH
VEGETATION
&
LAND USE
N
0
2000'
SCALE

LEGEND FOR VEGETATION AND LAND USE MAP

Adapted from 4-10-75 Aerial Photos
Field Reviews 7/79

	WATERSHED BOUNDARY			
	TOWN LINE			
	STREAM			
	UTILITY LINE	32 Acres	1.0% of total watershed	
	ROADS *	41 "	1.2% "	" "
	MIXED HARDWOODS	1316 "	39.6% "	" "
	INLAND WETLAND	779 "	23.5% "	" "
	RESIDENTIAL/COMMERCIAL	479 "	14.4% "	" "
	AGRICULTURAL LAND/OPEN FIELDS	377 "	11.4% "	" "
	SOFTWOODS	128 "	3.8% "	" "
	SOFTWOODS/HARDWOODS	109 "	3.2% "	" "
	POND	25 "	.8% "	" "
	DISTURBED LAND	20 "	.6% "	" "
	LAND FILL AREA	14 "	.5% "	" "
	TOTAL	3320 Acres	100% "	" "
	EXCESSIVE SLOPE+ >20% LIMITS USE AND MANAGEMENT	144 acres	4.3% "	" "

* Roads passing through residential or commercial areas are considered part of residential/commercial.

+ Area is tallied in other categories.

Areas of Environmental Sensitivity

Inland Wetland Areas. Any development which alters water table levels, increases the chance of contamination by pollutants, or creates lane way openings should be avoided to the maximum extent possible in the wetland areas of this watershed.

The vegetation present in the inland wetland areas is very sensitive to changes in the environment. As stated earlier, permanent changes in the water table usually result in a change in plant communities. A rise in the water table, for example, may be fatal to some species of plants while others may thrive; the result is a net change in species composition.

Contamination of these areas by water-carried pollutants and chemicals such as road deicing salts will also lead to mortality in certain species of plants, causing changes in the plant communities. Red maple, hemlock, and speckled alder are especially intolerant of higher-than-natural salt concentrations caused by runoff and splash of road deicing salts.

Changes in vegetation types may affect the ability of the wetland to store and regulate the discharge of water. This function of wetlands is critical in preventing flooding downstream during times of peak flows.

The windthrow hazard is severe in the hardwood swamp areas of this watershed, The trees in these areas are shallow-rooted and unable to become securely anchored in the saturated soils. Linear clearings in and along these areas will allow wind to pass through rather than over these stands increasing the already high windthrow hazard. Nondeveloped buffer zones of 50 to 150 feet wide, left vegetated around the hardwood swamp areas and streams will help to protect these areas from increased windthrow hazards. This buffer zone will also filter out and trap sediment, silt, and some pollutants before they reach, and lower the quality of, the wetlands.

Shallow to bedrock areas (see soils map and soils limitation for Brimfield and Hollis soils groups)/Areas where slopes exceed 20% (see vegetation and land use map).

Vegetation is sensitive to environmental disturbances, especially where soils are characteristically shallow to bedrock and slopes exceed a 20% grade. The windthrow hazard is severe in these areas because tree root systems are shallow. In areas where the underlying bedrock is highly fractured trees are able to become securely anchored because roots can penetrate deep into the cracks and fissures. Many of these areas are also somewhat excessively drained. Limited moisture reserves may restrict tree growth potentials. As trees in these areas are constantly under stress, they are more susceptible to damage by disease, insects, adverse weather conditions, and development. Trees growing in these areas will respond to forest management; however, rockiness and steep slopes severely limit harvesting and management operations.

Crowded Conifer Plantations. Severe crowding is limiting the health and vigor of many of the trees in the softwood plantations. Under these unhealthy conditions the trees are very susceptible to windthrow and top breakage. They are also sensitive to natural stresses such as insects, diseases, weather conditions, and to man-made stresses brought about by development. Periodic light

thinnings should help improve the health, vigor, and general stability of the trees in these stands.

FISH RESOURCES

Nelson Brook is a small stream which joins Cedar Swamp Brook a short distance downstream from Weaver Road. Cedar Swamp Brook flows south, crosses under Route 32, and feeds Eagleville Lake, an impoundment of the Willimantic River. The numerous wetland areas contained in the Cedar Swamp Brook Watershed act as a critical means of flood control in the area.

Nelson Brook contains suitable trout habitat; it is stocked with yearling Brook Trout and supports a recreational fishery.

Uncontrolled construction in the Cedar Swamp Brook drainage area will cause flooding problems. The loss of vegetation will increase the chance of erosion and augment the surface runoff, which will in turn increase the danger of flooding out the Route 32 bridge over Cedar Swamp Brook.

WILDLIFE

The Cedar Swamp Brook Watershed, located in the northeast hill ecoregion of the state, provides good habitat for upland wildlife, wetland wildlife, and, to some degree, farm wildlife species.

The central hardwood-hemlock-white pine vegetative characteristic furnishes potentially good habitat diversity for most upland wildlife species found in Connecticut such as white-tailed deer, ruffed grouse, gray squirrel, and numerous songbirds.

The wetland areas are relatively isolated from housing developments and other manmade disturbances, which is conducive to maximum biological potentials of the wetlands. This is especially important to furbearing species such as mink and river otter. In the publication "Rare and Endangered Species of Connecticut and Their Habitats" (1976), Dowhan and Craig suggest, "The rare and secretive Southern Bog Lemming (Synaptomys cooperi) has been recorded from White Cedar Swamps in this region."

The loss of habitat from permanent manmade disturbances, in most instances, forces an irreversible and irretrievable commitment of the wildlife resource. The following index provides an assessment of some potential wildlife populations in the area relative to acres per individual.

Species	Breeding
muskrat	0.5
mink	50.0
river otter	100.0
beaver	20.0
cottontail rabbit	0.75
raccoon	100.0
ruffed grouse	10.0
woodcock	20.0
gray squirrel	1.0
white-tailed deer	30.0

MANAGEMENT TECHNIQUES

WASTE MANAGEMENT

The Cedar Swamp Brook watershed is located in the northwestern corner of the town. The northern part of the watershed extends into the town of Willington. Cedar Swamp Brook empties into the Willimantic River at Eagleville Lake. A number of wetlands are located in the watershed, the largest of which is Cedar Swamp. Much of the area is hilly, with some steep escarpments along the streams, especially after Nelson Brook joins Cedar Swamp Brook.

A large amount of the watershed is undeveloped and is either forested or open fields. Low-density residential development occurs mostly along Route 44A and in the vicinity of Baxter and Hunting Lodge (Clubhouse) Roads. There are several apartment complexes along Route 44A, Hunting Lodge Road, and Route 195, and some commercial development where Routes 44A, 195, and 320 meet. There is no industrial development nor any major operating farms. The University of Connecticut adjoins the watershed along the southern border and the Mansfield Training School at the southwestern corner. Both of these agencies own land in the southern part of the watershed.

Although much of the watershed is undeveloped at present, it may be undergoing various types of development in the near future. To protect the watershed, there are areas with certain soil conditions which should be avoided for any type of use which requires on-site waste disposal and water supplies.

On-site soil testing is necessary to determine the suitability of specific areas, but general suitabilities can be determined from the Soil Conservation Service mapping of the area. Large areas of soil in the Charlton series (CrC, CrD, CaB, ChB) are scattered throughout the southern part of the watershed. Charlton soils are generally suitable for subsurface sewage disposal but steep slopes and stoniness may present problems in some areas.

Areas of special concern in the proper installation and functioning of subsurface sewage disposal systems are:

1. Wetland areas.
2. Other soils with high maximum groundwater levels.
3. Soils with a slowly permeable or impermeable layer close to the surface (hardpan).
4. Soils which are shallow to bedrock.
5. Steeply sloping areas.

Wetlands are scattered throughout the watershed, and these areas are totally unsuited to subsurface sewage disposal. Peat and muck soils (Pk on the soil map) are found in most of these wetland areas. These soils are saturated with water for most of the year. Septic systems cannot operate under these conditions. Other soils associated with the wetlands are the Leicester (Lg and Le) and Whitman (Wp) soils. Strips of these soils are located along the stream banks and around the

ponds and wetlands. Both of these soils are poorly drained, with the water table at 6 inches or less during the spring. The water table may remain fairly high throughout much of the year. Contamination of surface and groundwater with sewage effluent would be very probable with systems installed in these soils.

Soils in the Sutton series (SwA, SwB, SxB) have a high groundwater table during the spring. If a septic system is installed too close to the water table, it may be flooded for extended periods of time when the water level is high. This would prevent the septic system from functioning properly and cause contamination of the groundwater.

Soils underlain by a hardpan present severe limitations in the operation of subsurface sewage disposal systems. Soils in the watershed with hardpan layers are in the Paxton series (PbB, PbC, PdB, and PeC) and the Woodbridge series (WxA, WxB, and WzC). The hardpan in most of these soils is less than 30 inches below the surface. The hardpan layer is very slowly permeable to impermeable, so it cannot accept sewage effluent. On slopes, the effluent can move on top of the hardpan layer and may discharge to the surface of the ground.

Another problem with hardpan soils is the potential presence of a perched water table. Since water cannot move quickly through the hardpan, it may sit on top of the layer for extended periods of time. If a septic system is installed within this zone, it will not operate properly. This limitation can be overcome by a properly engineered design of the systems.

Soils which are shallow to bedrock should be avoided in the construction of septic systems. The Hollis series (HrC, HxC, HxE) consists of rocky soils with bedrock generally less than 20 inches from the surface. Outcroppings of ledge are common in these soils. A shallow depth to ledge severely limits the operation of septic systems. Groundwater and septic effluent may travel either on top of the bedrock or along cracks in the rock, which may cause contamination of water supply wells and surface water.

Soils which are ordinarily suitable for subsurface sewage disposal when found on level areas or gentle slopes (such as those in the Charlton series) may be more limiting on steeper slopes. Slopes greater than 8% to 10% pose difficulties in properly installing septic systems. Also, there is a great potential for contamination of surface water and wells with soils on steep slopes if underlain by hardpan or shallow bedrock.

EROSION CONTROLS

For the priority area, which has large tracts of undeveloped land, it is important for adequate erosion and sediment controls to be in place if development does occur. Steep terrain characterizes much of the priority area, which increases the danger from erosion and sedimentation. Large areas of wetlands, two brooks, and an old mill pond in this area would be particularly susceptible to impact from sedimentation. Such an impact could mean the filling in of wetlands and the mill pond by sediment, plus a change in the biotic community of the brooks.

Four basic management techniques may be used to prevent excessive erosion: (1) the total amount of land disturbance should be kept to a minimum. This would require low density and land development control regulations which do not encourage

extensive land disturbance when homes and other structures are being built; (2) construction that is permitted should occur on land of moderate slopes. Even slopes of 7 to 8% significantly increase the potential impact of erosion and sedimentation; (3) actual land disturbance should be well removed from any pond or streambank, and buffers of undisturbed natural vegetation of 50 feet or more should be maintained along all principal watercourses; (4) erosion control measures should be diligently applied whenever land is disturbed during construction activity.

Connecticut's Erosion and Sedimental Control Handbook published by the Soil Conservation Service can aid in developing erosion and sediment control plans for future development in the watershed area. Vegetative and mechanical means for minimizing erosion are outlined in this handbook. Technical assistance for implementing these plans can be obtained from the Tolland County Soil and Water Conservation District, Agricultural Center, Route 30, Vernon. Telephone 875-3881.

FOREST MANAGEMENT

The Forestry Unit of the Department of Environmental Protection encourages all woodland owners to manage their forest land. When properly prescribed and executed, forest management practices will increase the production of forest products, improve wildlife habitat and enhance the overall condition of the woodland with minimal negative environmental impact. A public service forester may be contacted to provide basic advice and technical assistance in woodland management; however, services of a more intensive nature are available from private consulting foresters.

In an effort to minimize negative environmental impact through better harvesting practices, the establishment of enforceable zoning ordinances which regulate forest management practices deserves consideration. (See Appendix.)

RECREATION POTENTIAL

Recommendations made are based on recognition of sensitive or uncommon areas which should suffer minimal disruption or which because of scenic value or a specific feature would lend themselves to recreational development. One of the first things the town should determine is the proportion of different types of land use it hopes to accommodate based on the resource base. In other words, X percent may be allotted for residential development, Y percent for industrial, Z percent for recreation, etc. The resource base (soil types, topography, etc.) will determine developability.

There are specific portions of the study area which should probably be maintained very nearly as they now are. The swamp areas are not buildable according to inland wetland regulations. The southern portion of Cedar Swamp Brook in the area of the Gurley Cemetery is scenic and is a valuable greenbelt. The portion between Weaver Road and the pond near the Gurley Cemetery lies in an undeveloped valley almost one mile long. The portion south (downstream) of the pond and cemetery lies in a hemlock-lined gorge. This entire stretch of brook is comparatively natural and worth maintaining for open space and recreation. There are few towns in Connecticut that can claim an asset of this type and size. An abandoned hiking trail traverses the westerly side of the brook between the cemetery and Weaver

Road. The stream's fishing potential and the area's hiking aspect appear to be readily exploitable by more people than are now using it. Preservation of the lower Cedar Swamp Brook by fee simple purchase, easements, or other binding agreements should probably be a priority item in the town's land use planning.

Some areas of high value, from the standpoint of providing food, water, beauty, recreation, and cultural ties are: aquifers, streambelts and other water bodies and wetlands, prime agricultural land, historic sites, and areas of high scenic value or which provide greenbelt relief from man's development. These greenbelts also help provide improved air quality, wildlife habitat, and opportunities for hunting.

Possibilities for active recreational development include:

1. Foot trail and/or bike trails which could be used to connect the various components of a recreation system. This is a sometimes difficult task when rights of way are being sought since some landowners are not amenable to trails being routed across their land. If achieved however, the tied-together and open-space components of a system offer enhanced options for development and usability as well as the potential for gas savings.

2. Other trail related activities - jogging, horseback riding, nature study, cross-country skiing, snowshoeing, snowmobiling.

3. Swimming - there appear to be very limited possibilities for this in the study area. The pond in Cedar Swamp Brook near the Gurley Cemetery has the greatest, albeit doubtful, potential for development as a swimming area.

4. Fishing.

5. Open field activities - ball games, kite flies, model airplane flying, etc. No area has been targetted for this.

6. Winter sports such as ice skating, ice fishing, sledding, snowmobiling, etc.

7. Camping - a possibility, but probably not sought by the town.

8. Picnicking - many woodland areas (especially conifer stands) will lend themselves to this activity to some degree.

Undeveloped hilltops can offer scenic vistas along hiking trails or low density use picnic areas.

Mansfield is fortunate in that the town is still fairly rural with some sizable tracts of open space. Acquisition of land now for future recreational use by the town may be a prudent move if land can be purchased at a reasonable price. As development pressure increases and available land dwindles, land prices will rise commensurately.

Some traditional recreation demand priorities (from Connecticut SCORP) are:

1. Swimming.
2. Boating.

3. Camping.

4. Recreational pathways (2 types):
   a. Non-motorized - includes bikeways, hiking trails, bridle trails, hiking;
   b. Motorized - snowmobile, motorcycle;

5. Historical, cultural, and scenic areas.

To meet these demands and provide for increased future demand, it is essential that the sites having the potential to accommodate these activities be preserved. An assertive program of acquisition of sites, so identified, should be undertaken. By preserving these critical water bodies, cultural, historic, scenic, and natural areas, the ability to meet these demands and offer the town resident a high quality of life will be more assured. Examples of these areas would be: lakes, ponds, marshes, streams, hilltops offering scenic vistas and which are undeveloped, and historic homesites. Accessibility either by foot or vehicle is necessary; it would be pointless to acquire an isolated tract of land with no land corridor or right of way available.

Specific examples of these types of sites in the study area would be the lower portion of Cedar Swamp Brook - number 1 on recreation potential map; the hilltops - number 2 on the map; and swamp areas - number 3 on the map. Preservation of important aquifers and wetlands for continued water supply and flood water storage capacity will serve the two-fold purpose of fulfilling these functions while providing aesthetic and recreational benefits.

LAND USE

The Cedar Swamp Brook watershed is typically suburban in its land-use characteristics. Apartment developments at a density of four units to the acre and subdivisions of single-family homes at one unit to the acre are common throughout the watershed. Commercial development is isolated but prominent in the eastern portion of the watershed in the Mansfield four-corners area. Despite the considerable urban development, significant natural areas and features remain, including the "Pink Ravine" and Cedar Swamp. Most undeveloped land is associated with wetlands and watercourses, including the large area of undeveloped land at the head of the Pink Ravine, long owned by the University of Connecticut. The most intensive urban development is located in the eastern portion of the watershed, where a large mobile home park is found adjacent to the developing commercial area.

The proximity of the University and the convenience of the area for commuting to Hartford have encouraged development in the past. The growing importance of the four-corners area as a retail and service district will probably continue to support additional residential expansion within the watershed.

The pattern of development in most communities has usually been determined by whoever could offer the most money for any given tract. For this reason much prime farm land has been irretrievably lost to residential, commercial, and industrial development. Hopefully, the trend is being changed by programs which seek to buy the development rights on farm land. This type of disincentive to sell to the developer, who is usually the highest bidder, may be looked at as a

positive measure. The traditional financial realities have been such that a person who cannot afford to hold onto his or her property because of high taxes or other reasons will usually sell to the highest bidder. As a result, many land tracts are misappropriated to a use which is mismatched to its productive capacity.

It would be desirable to have land development patterned on the basis of the natural resources' (land and hydrologic base) "best and highest use." The stress would be toward development based on the land's ability to sustain certain activities with minimum disruption to it and adjacent areas. In some cases this will work to reduce the quick-profit motive, but it should ultimately ensure maximum economic use of town lands by wise management, which would eliminate the need for subsequently costly corrective actions.

Community self-sufficiency is not a realistic possibility in today's highly specialized and structured society but striving for relative self-sufficiency for some of the more basic needs such as food production will help to moderate the fuel crisis by reducing transport costs. Continued loss of the states' farm land will only serve to accentuate the problem of fuel and food costs and make for less efficient distribution. Lands which are marginally agricultural may, however, be well-suited to residential development. In this instance the land's inability to support an economic farm operation may mean that it is able to shift to an activity for which it is better suited.

Regional planning is essential for coordinated, non-conflicting use patterns to ensure conservation of the resources. An example, Cedar Swamp is in the Towns of Willington and Mansfield. The Cedar Swamp Brook watershed does not lie completely in Mansfield. Actions taken with good or bad effects on that watershed will impact the environment without regard to political boundaries. Cooperative management between the towns involved is therefore required to properly manage and protect this valuable resource.

Available, high quality water supplies appear to be a diminishing commodity. Tainted water supplies are continually being discovered as a result of more sophisticated monitoring apparatus and techniques and ever increasing development of areas by man. Recognition of and demand for some of the benefits the water resource provides is accentuated as the years pass, and as the demand increases while the supply remains static or diminishes.

Sites of geological significance or of unique plant and animal communities should be identified and preserved. A thorough inventory of the town's landforms will help pinpoint any highly sensitive areas as well as the more developable ones. Knowing the land, its attributes and its limitations is the first and most important factor in determining how it might best be managed.

DEVELOPMENT TRENDS AND ZONING

The University of Connecticut is not likely to generate major new residential development in the near future. Rather, the watershed is more likely to see residential expansion as a result of a general trend of suburbanization, now common to Mansfield, Willington, and Coventry. The pace of that suburbanization is unclear for the near future, but at whatever rate it occurs, new homes will be located on increasingly marginal parcels of land. Limitations to development such as poor soil conditions, steep slopes, odd sizes, or inaccessibility will

be common in these areas. Such development patterns will put pressure on the wetlands and water courses as the more easily developed land is used and attention is focused on those areas more costly to develop, typically in close proximity to the wetlands.

The current zoning that regulates development in the watershed is fairly typical of such a suburban area; that is, single family homes on minimum one-acre lots are permitted by right; apartments at a density of four units to the acre may be constructed after the issuance of a Special Permit. In addition, the subdivision regulations provide for dedication of open space whenever a parcel of land is divided into building lots.

While perfectly reasonable under the conditions prevailing within the watershed, the zoning regulations will undoubtedly come under increasing strain as attempts are made to extract the maximum development potential out of smaller or marginal lots. Protection of valuable natural resources under such conditions becomes more difficult. Therefore protection of major streambelts and wetlands should be a high priority. Maximum flexibility should be incorporated in the land use regulations to insure that streambelt corridors, as identified by the Plan of Development and the Conservation Commission, are granted wide buffer protection. While maintaining the existing density standards, special provisions could be made for excluding significant areas of wetland from calculation of lot size, thereby minimizing the negative impact on wetlands when too many acre lots are attempted in areas where wetlands are a substantial portion of the land. Flexibility in yard requirements and actual lot sizes through various cluster zoning techniques would permit development of additional land without unreasonable destruction of wetlands and other natural features.

OVERVIEW

The Cedar Swamp Brook watershed may have less future development potential than most areas of comparable size in eastern Connecticut. An unusually large percentage of this watershed area is occupied by wetlands. Development has already occurred in some of the most suitable sections of the watershed. The drainage area of Cedar Swamp Brook north of its confluence with Nelson Brook has been especially affected, with an apartment complex off Cisar Road in Willington, a housing development just to the south along Routes 32 and 195 in Mansfield, and two trailer parks along Route 44A in Mansfield.

In general, the areas within the watershed that are most suitable for development are those with the gentlest slopes, the deepest soils, and the greatest depths to the water table. Increasing slopes and decreasing depths of soil often go hand in hand: steep slopes commonly reflect an underlying bedrock surface that was only thinly covered with glacial sediments. These areas also tend to have seasonal high water problems, since the presence of bedrock at shallow depths inhibits the downward movement of water. Development of such difficult sites often results in erosion, failing septic systems, and groundwater contamination.

Development of wetland areas should be avoided to the greatest extent possible. In addition to their invaluable role in ecological systems, wetlands also

provide storage areas for flood waters, reducing the flow rates in local streams during storms. This flow reduction may lessen the extent and severity of flood flows and, consequently, flood damages. Of course, the magnitude of flood increases from wetland development would depend upon the location and size of the wetland area filled.

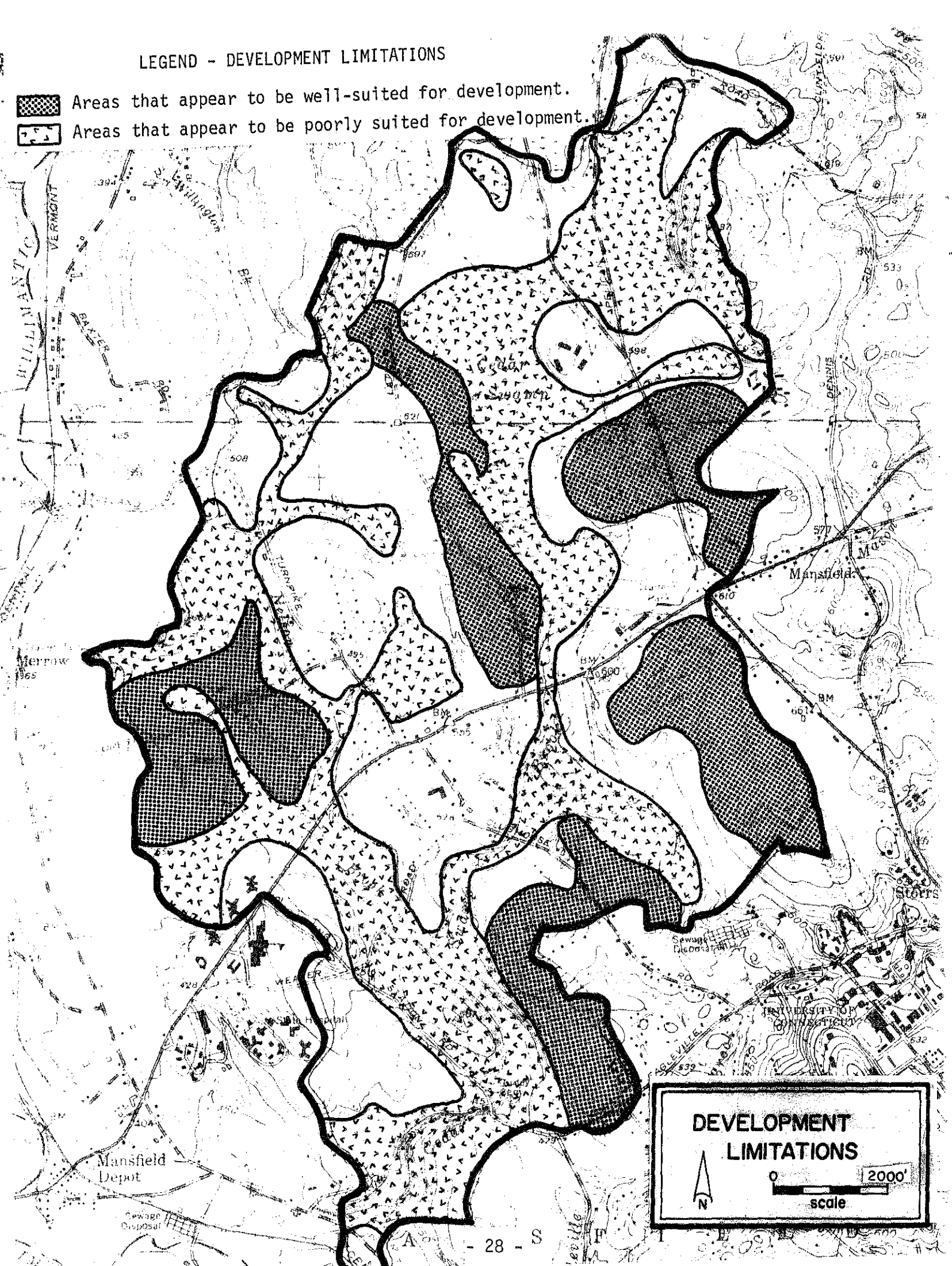
Filling of wetland areas may also, in some circumstances, cause an increase in water levels, resulting in the death of some wetland vegetation. The partial damming of Cedar Swamp by Route 195 has apparently had such an effect, causing the mortality of red maples in an area extending 1,000 feet north of the road. Such drastic changes in the vegetation may have serious effects in terms of the overall ecology of the region.

Figure 4 shows sections of the Cedar Swamp Brook watershed that appear most suitable for development and sections that appear least suitable from a geologic-hydrologic viewpoint.

LEGEND - DEVELOPMENT LIMITATIONS

Areas that appear to be well-suited for development.

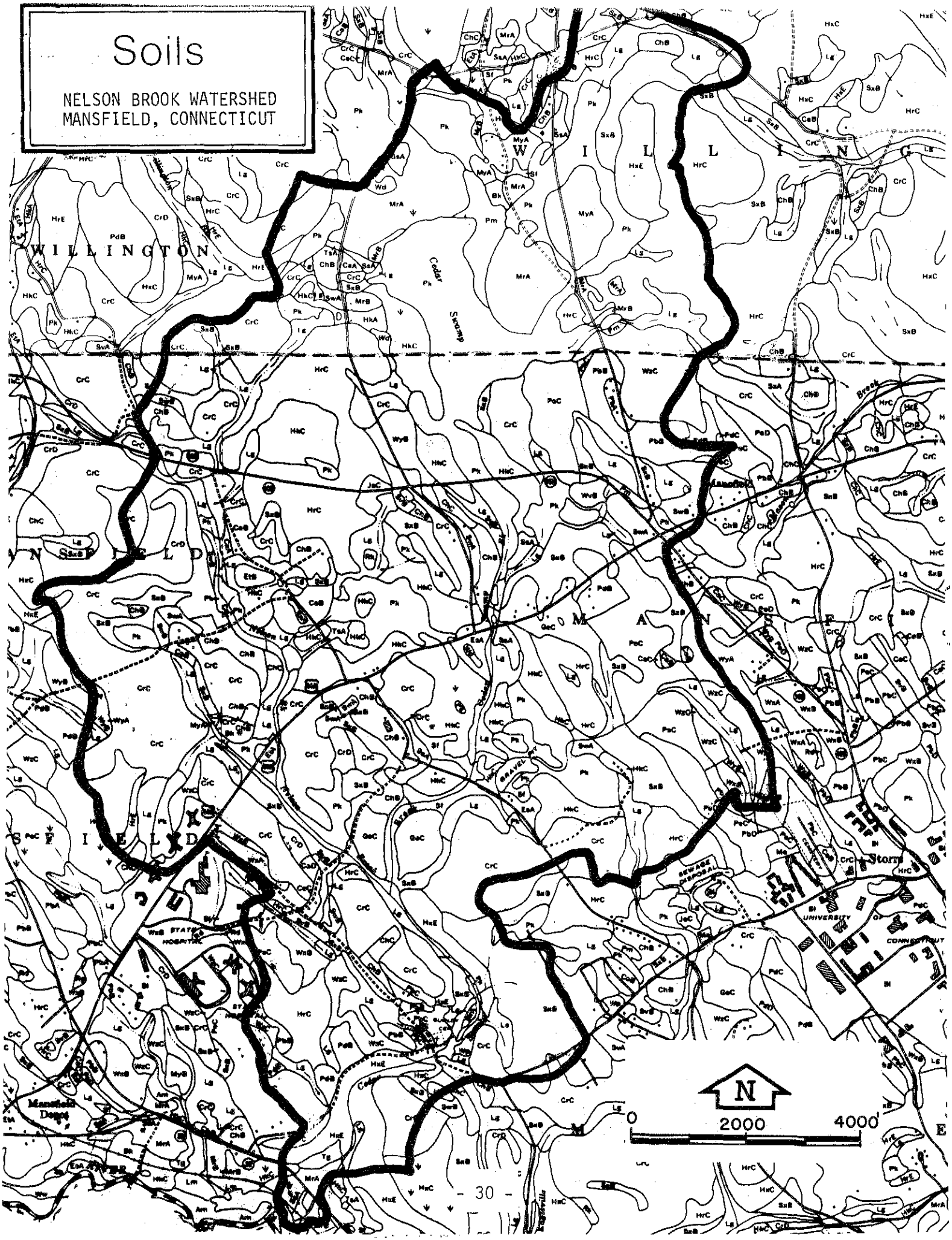
Areas that appear to be poorly suited for development.



Appendix

Soils

NELSON BROOK WATERSHED
MANSFIELD, CONNECTICUT



ENTIRE NELSON BROOK WATERSHED

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

3105.9 Total Acres

Soil Series and Symbol	Approx. Acres	Percent of Acres	URBAN USE LIMITATIONS: On-Site Sewage	Buildings with Basements	Streets and Parking	Land-scaping	RECREATION LIMITATIONS: Camp Areas	Picnic Areas	Play-grounds	Trails and Paths	Principal Limiting Factors
Borrow & Fill Lands											
BK	7.5	0.2	Varies	Varies	Varies	Varies	Varies	Varies	Varies	Varies	
Charlton											
**CaA	3.1	0.1	1	1	1	1	1	1	1	1	
**CaB	28.0	0.9	1	1	1	1	1	1	2	1	
CaC	4.3	0.1	2	2	2	2	2	2	3	1	Slope
CaD	1.2	0.04	3	3	3	3	3	3	3	2	Slope
ChB	105.5	3.4	2	2	1	2	2	2	2	2	Stoniness
ChC	16.9	0.5	2	2	2	2	2	2	3	2	Stoniness, Slope
CrC	477.4	15.4	2	3	2	3	3	2	3	3	Large Stones, Slopes
CrD	30.6	1.0	3	3	3	3	3	3	3	3	Large Stones, Slopes
Gloucester & Charlton											
GeC	58.1	1.9	2	2	2	2	2	2	3	2	Slope
Enfield											
**EsA	15.0	0.5	1	1	2	1	1	1	1	1	
**EtA	10.0	0.3	1	1	1	1	1	1	1	1	
**EtB	4.9	0.1	1	1	1	1	1	1	2	1	
Gravel Pit	11.9	0.4	Varies	Varies	Varies	Varies	Varies	Varies	Varies	Varies	

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series and Symbol	Approx. Acres	Percent of Acres	URBAN USE LIMITATIONS: On-Site Sewage	Buildings with Basements	Streets and Parking	Land-scaping	RECREATION LIMITATIONS: Camp Areas	Picnic Areas	Play-grounds	Trails and Paths	Principal Limiting Factors
Hinckley											
**HkA	4.4	0.1	1	1	1	2	2	2	1	2	Sandiness
HkC	262.3	8.4	2	2	2	2	2	2	3	2	Slope, Sandiness
Hollis											
HrC	306.3	9.9	3	3	3	2	2	3	3	2	Depth to Bedrock
HrE	4.3	0.1	3	3	3	3	3	3	3	3	Slope, Depth to Bedrock
HxC	8.7	0.3	3	3	3	3	3	2	3	3	
HxE	75.6	2.4	3	3	3	3	3	3	3	3	
Jaffrey											
JaC	5.6	0.2	2	2	2	2	2	2	3	2	Sandy, Small Stones
Leicester											
*Le	6.2	0.2	3	3	3	3	3	3	3	3	Wetness
Leicester-Ridgebury-Whitman											
*Lg	280.3	9.0	3	3	3	3	3	3	3	3	Wetness
Merrimac											
**MrA	115.6	3.7	1	1	1	1	1	1	1	1	
**MrB	6.8	0.2	1	1	1	1	1	1	2	1	
**MyA	44.9	1.4	1	1	1	1	1	1	1	1	

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series and Symbol	Approx. Acres	Percent of Acres	URBAN USE LIMITATIONS: On-Site Sewage	Buildings with Basements	Streets and Parking	Land-scaping	RECREATION LIMITATIONS: Camp Areas	Picnic Areas	Play-grounds	Trails and Paths	Principal Limiting Factors
Paxton											
**PbA	4.3	0.1	3	2	2	2	2	1	2	1	Seasonal Wetness
**PbB	34.4	1.1	3	2	2	2	2	1	3	1	Seasonal Wetness
PbC	4.9	0.1	3	2	2	2	2	2	3	1	Seasonal Wetness
PdB	35.6	1.1	3	2	2	2	2	1	3	2	Wetness, Stoniness
PeC	115.6	3.7	3	2	2	2	2	2	3	2	Wetness, Stoniness
PeD	16.2	0.5	3	3	3	3	3	3	3	2	Slope
Peat & Muck											
*Pk	354.8	11.4	3	3	3	3	3	3	3	3	Wetness
*Pm	24.3	0.8	3	3	3	3	3	3	3	3	Wetness
Ridgebury											
*Rd	2.5	0.08	3	3	3	3	3	3	3	3	Wetness
*Rg	0.6	0.01	3	3	3	3	3	3	3	3	Wetness
Rockland											
Rk	37.2	1.2	3	3	3	3	3	3	3	3	Rockland
Scarboro											
*Sf	21.2	0.7	3	3	3	3	3	3	3	3	Wetness
Sudbury											
**SsA	28.2	0.9	3	3	2	1	1	1	2	1	Wetness
Sutton											
**SvB	3.1	0.1	3	3	2	1	1	1	1	1	Wetness
SwA	30.0	1.0	3	3	2	2	2	1	2	2	Wetness, Large Stones
SwB	25.5	0.8	3	3	2	2	2	1	2	2	Wetness, Large Stones

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series and Symbol	Approx. Acres	Percent of Acres	URBAN USE LIMITATIONS: On-Site Sewage	Buildings with Basements	Streets and Parking	Land-scaping	RECREATION LIMITATIONS: Camp Areas	Picnic Areas	Play-grounds	Trails and Paths	Principal Limiting Factors
Sutton											
SxA	1.2	0.04	3	3	2	2	2	1	2	2	Wetness, Large Stones
SxB	300.2	9.7	3	3	2	2	2	1	2	2	Wetness, Large Stones
Terrace Escarpment											
Tg	4.4	0.1	3	3	3	3	3	3	3	2	Slope
Tisbury											
**TsA	8.0	0.2	3	3	3	1	1	1	2	1	Wetness
Whitman											
*Wp	3.1	0.1	3	3	3	3	3	3	3	3	Wetness, Large Stones
Windsor											
**WvB	5.0	0.1	1	1	1	2	1	1	2	1	
Woodbridge											
**WxA	21.1	0.7	3	3	3	1	2	1	2	1	Wetness
**WxB	19.4	0.6	3	3	3	1	2	1	2	1	Wetness
**WyA	19.3	0.6	3	3	3	2	2	1	2	2	Wetness, Large Stones
WyB	18.1	0.6	3	3	3	2	2	1	2	2	Wetness, Large Stones
WzC	72.3	2.3	3	3	3	3	2	1	3	2	Wetness, Large Stones

PRIORITY AREA - NELSON BROOK WATERSHED

ACREAGE SUMMARY OF LIMITATIONS

1018.6 Acres	Slight		Moderate		Severe	
	Acres	%	Acres	%	Acres	%
On-Site Sewage	42.9	4.2	439.2	43.1	536.5	52.7
Buildings with Basements	42.9	4.2	164.0	16.1	811.7	79.7
Streets and Parking	41.0	4.0	338.8	33.3	638.8	62.7
Landscaping	69.7	6.8	363.2	35.6	585.7	57.5
Camp Areas	51.6	5.1	398.7	39.1	568.3	55.8
Picnic Areas	102.7	10.1	626.3	61.5	289.3	28.4
Playgrounds	28.1	2.8	89.7	8.8	900.8	88.4
Trails and Paths	77.1	7.6	378.8	37.2	562.7	55.2

NELSON BROOK WATERSHED - ENTIRE AREA

ACREAGE* SUMMARY OF LIMITATIONS

3086.5* Acres	Slight		Moderate		Severe	
	Acres	%	Acres	%	Acres	%
On-Site Sewage	237.7	7.7	930.1	30.1	1918.7	62.2
Buildings with Basements	237.7	7.7	647.5	21.0	2201.3	71.3
Streets and Parking	328.2	10.6	1422.6	46.0	1335.7	43.3
Landscaping	312.5	10.1	1353.1	43.8	1420.9	45.6
Camp Areas	272.6	8.8	1465.3	47.5	1348.5	43.7
Picnic Areas	854.0	27.7	1068.1	34.6	1164.4	37.7
Playgrounds	196.1	6.3	625.3	20.3	2265.1	73.4
Trails and Paths	361.0	11.7	1398.7	45.3	1326.8	43.0

*Figure does not include 19.4 acres of fill and gravel pit

KEY:

* Inland Wetlands as defined by P. A. 155 as amended

** Prime Farmlands as defined by USDA National Cooperative Soil Survey

SOILS LIMITATIONS:

1 - Slight Limitations

2 - Moderate Limitations

3 - Severe Limitations

SOIL INTERPRETATIONS FOR URBAN USES

The ratings of the soils for elements of community and recreational development uses consist of three degrees of "limitations:" slight or no limitations; moderate limitations; and severe limitations. In the interpretive scheme various physical properties are weighed before judging their relative severity of limitations.

The user is cautioned that the suitability ratings, degree of limitations and other interpretations are based on the typical soil in each mapping unit. At any given point the actual conditions may differ from the information presented here because of the inclusion of other soils which were impractical to map separately at the scale of mapping used. On-site investigations are suggested where the proposed soil use involves heavy loads, deep excavations, or high cost. Limitations, even though severe, do not always preclude the use of land for development. If economics permit greater expenditures for land development and the intended land use is consistent with the objectives of local or regional development, many soils and sites with difficult problems can be used.

Slight Limitations

Areas rated as slight have relatively few limitations in terms of soil suitability for a particular use. The degree of suitability is such that a minimum of time or cost would be needed to overcome relatively minor soil limitations.

Moderate Limitations

In areas rated moderate, it is relatively more difficult and more costly to correct the natural limitations of the soil for certain uses than for soils rated as having slight limitations.

Severe Limitations

Areas designated as having severe limitations would require more extensive and more costly measures than soils rated with moderate limitations in order to overcome natural soil limitations. The soil may have more than one limiting characteristic causing it to be rated severe.

Appendix B

Location: Nelson Brook Watershed

Quad: South Coventry

A. Setting

1. surrounding topography: rolling hills of intermediate elevation generally between 450' and 500', within the northeast hills ecoregion
   a. average slope: 2-10% generally, except steeper (up to 15%) toward confluence with Cedar Swamp Brook
2. hydrologic location:
   a. drainage area (sq. mi.) 1.68
   b. tributary (or part of which major basin) Cedar Swamp Brook to Willimantic River
3. surficial geology: Predominantly till; very minor amounts of stratified material
4. bedrock geology: not mapped
5. soils: wetland soils shown as PK or Lg's with Lg's right along stream, PK's in back-water of floodplains
6. degree of association with other wetlands: within a ¼ mile of a larger wetland system, but not inter-connected with it
7. proximity of population centers: no urban center within the watershed
8. surrounding habitat types and land use: Predominantly forest, farm and open space. Minor areas of residential development.

B. Wetland Interior

1. wetland type(s) ☒ Open H_2O ☒ Meadow & flat ☐ Marsh ☒ Swamp ☐ Bog
2. size (acres): 150-200 acres
3. shoreline
   a. shape: elongated, narrow
   b. slope: 2-8%
4. vegetation
   a. trees (Note dominant vegetation with an *)
      1) species: see attached list
      2) relative abundance (% total cover): 30%
      3) spatial distribution: generally occur in linear, peripheral bands adjacent to upland species
      4) density: moderate
   b. shrubs
      1) species: see attached list

2) relative abundance (% total cover): 60% sapling, 10% bushy

3) spatial distribution: generally from water course outward to wooded swamp

4) density: low to moderate

c. emergent vegetation

1) species see species list

2) relative abundance (% total cover): 70%

3) spatial distribution: Never dominant but ever present except in very small patches in backwater of road culverts

4) density: high, except in mature red maple swamp

d. floating and floating-leaved vegetation

1) species: see species list

2) relative abundance (% open water surface covered): minor (less than 1%)

3) spatial distribution: In water course only; practically none in ponds

4) density: very low

e. submergent vegetation minor (less than 1%)

1) species: see species list

2) relative abundance (% open water area): minor (less than 1%)

3) spatial distribution: In water course only; practically none in ponds

4) density: very low

f. interspersion of life forms and subforms:

Relatively low - most of area predominantly shrub or deciduous wooded swamp

g. interspersion of cover and open water: There is only about 3-5% open water, and only one small pond is within the main stem of Nelson Brook.

h. dead woody vegetation: very little

5. water

a. average size of open areas: less than 2 acres

b. % open water: 3-5%

c. color: generally clear

d. depth: shallow average: 6" to 5' range: generally less than 4'

e. sedimentation: some evidence of it at road crossings, otherwise, no particular problems noted

f. turbidity: low (visual siting only)

g. evidence of pollution: only at State Highway Site by CT 44A, where fill and apparent salt storage has caused creation of small area of dead vegetation and growth of cattail and phragmites populations.

6. animal life

a. muskrats: ☐ bank dens ☐ runways ☐ cutting, food piles ☐ lodges (#)

b. other mammals: deer tracks

c. reptiles, amphibians, fish: supports large populations of frogs, salamanders, and numerous small fishes.

d. waterfowl: some ducks (mallards) seen in small ponds and along the brook.

e. non-game birds Numerous song birds (not inventoried)

f. other

g. overall wildlife value moderate - 75.0 on modified Golet Scale

C. Engineering

1. hydrogeology of basin in which site located Low permeability of peat and muck and Leicester soils in wetlands, relatively well drained soils; however, are over till and do not yield substantial water quantities.
2. hydraulics of existing restrictions (existing pipe, bridges, and waterway passages) There are restrictions caused by each roadway crossing
3. existing sediment and erosion problems Some road sand; some problems at Route 44 DOT site otherwise, OK.
4. flood proneness All of Nelson Brook considered to be within HUD flood hazard area. This zone ranges from approximately 100' wide about Route 195 to 300' wide near Route 44A. The floodplain is constricted only near its terminus with Cedar Swamp Brook.
5. potential aquifer No areas likely to qualify as important ground water sources

D. Site Visit

1. date - 5/17, 8/17, 9/5

2. others present 8/17 - Les Mehrhoff, 9/5 - Ken Metzler

3. antecedent moisture conditions Rain within several days of visits

4. unusual ground conditions Groundwater table normal to slightly above normal

SPECIES LIST

	Scientific Names	Common Names
Trees:		
*	*Acer rubrum*	Red Maple
	Pinus rigida	Pitch Pine
	Pinus strobus	White Pine
	Quercus bicolor	Swamp White Oak
	Salix sp.	Willow
**	*Toxicodendron vernix*	Poison Sumac
Shrubs:		
*	*Acer rubrum*	Red Maple
	Alnus serrulata	Common or Smooth Alder
	Alnus rugosa	Speckled Alder
**	*Cornus amomum*	Silky Dogwood
	Ilex verticillata	Winterberry
	Lyonia legustrina	Maleberry
	Rosa palustris	Swamp Rose
	Salix sp.	Willow
	Spirea tomentosa	Steeplebush or Hardhack
	Spirea latifolia	Meadowsweet
	Toxicodendron radicans	Poison Ivy
**	*Toxicodendron vernix*	Poison Sumac
	Vaccinium corymbosum	High Bush Blueberry
	Viburnum lentago	Nannyberry
	Viburnum recognito	Arrowwood
	Vitis lambrusca	Fox Grape

* Dominant

** Subdominant

Emergent

Scientific Names	Common Names
Aster spp.	Asters
Boehmeria cylindrica	Boghemp or False Nettle
Calamogrostis sp.	Blue-joint
Caltha palustris	Marsh marigold
* *Carex stricta*	Tussock sedge
Chelone glabra	Turtlehead
Cicuta maculata	Water-hemlock
Dryopteris spp.	Wood ferns
Eleocharis acicularis	Tufted Spike rush
Galium asprelluim	Bedstraw
Gentiana clausa	Bottle Gentian
Glyceria sp.	Manna grass
Habenaria psychodes	Soldier's plume or Small purple fringed orchid
Hydrocotlyle sp.	Water-pennywort
Impatiens spp.	Touch-me-not, jewelweed
Iris versicolor	Blue Flag
Leersia sp.	Rice Cut Grass
Lobelia cardinalis	Cardinal Flower
Lycopus sp.	Bugleweed
Lysimachia ciliata	Fringed Loosestrife
Lysimachia terrestris	Swamp Candle or Yellow or Swamp Loosestrife
Omoclea sensibilis	Sensitive Fern
Osmunda cinnamonea	Cinnamon Fern
Osmunda regalis	Royal Fern
Phragmites Communis	Common Reed
Polygonum sagittum	Arrow leaved tearthumb
Scirpus cyperinus	Woolgrass
Scirpus validus	Soft-stem bulrush
Scutellaria lateriflora	Mad dog skull cap
Solidago patula	Goldenrod
Sphagnum	Sphagnum moss
Sparganium sp.	Bur-reed
Symplocarpus foetidus	Skunk cabbage
Thelypteris palustris	Marsh Fern
Typha latifolia	Common Cattail or Broad leaved Cattail

* dominant

Submergents

Ludwigia palustris	Water purslane
Najas sp.	Pondweed, naiad
Utricularia sp.	Bladderwort

Floating - Leaved Plants

Potamogeton sp.	Pondweed

Appendix C

SECTION 8

MINIMUM STANDARDS FOR THE CUTTING OF TIMBER

PREAMBLE

Harvesting of forest tree species is an integral part of forest management by which wood for human use is obtained and by which forests are established and tended. It is recognized that during harvesting operation, there will be temporary change in the forest environment. It is the purpose of these guidelines to establish harvesting standards which will maintain the productivity of land for continuous forest crops, improve wildlife habitat, and minimize negative environmental impact.

PERMIT REQUIRED

It is unlawful for a person to harvest forest tree species without a permit, except as follows: (1) Land used for agricultural purposes and cultivation of crops other than forest products, (2) Land used or being developed for residential, recreational or other non-woodland commercial purposes, (3) Thinning and clearing in connection with public improvements, (4) Land Used for access to abutting land, and (5) Cultured Christmas tree area.

The application for a permit shall consist of a plot plan showing the applicant's property and the abutting property owners, a cutting plan indicating the nature of the operation, and a certification of the cutting plan by a public or consulting forester indicating the plan's conformance with the minimum standards set forth herein.

STANDARDS

I. STREAM PROTECTION[1]

1. All possible care will be taken to protect continuously flowing streams and other water bodies from siltation and other damage during harvest operations.

[1] Streams are defined as perennial streams indicated on U.S.G.S. Topographic maps, scale 1:24,000.

Partial cuttings, designed to create uneven-aged stands, will normally be used within 100 feet of these water courses. No more than fifty percent of the merchantable volume will be removed, taking care in the selection of leave trees to minimize water temperature increases and visual impact.

2. Care should be taken not to fell trees into or across streams. Logging debris accidentally dropped into streams and ponds shall be promptly removed.

3. Harvesting equipment will not ordinarily be allowed in a stream and the channel should not be altered. All stream crossings will be as close to a right angle as possible.

4. After the completion of a harvest operation, banks at stream crossings will be graded and restored to approximate their original condition. Re-seeding with an appropriate grass mixture may be required.

5. Any and all temporary structures in or across streams will be removed upon completion of operations.

II. LOGGING ROADS AND TRAILS

Careful consideration should be given to the planning and location of main haul or skid roads. All road locations, including alternate routes where advisable, will be planned prior to harvesting operations.

Outstanding considerations are:

1. Location so as to minimize construction or use impact on the land.

2. Grades in excess of 10%, or 0% gradients will be avoided except for short distances.

3. For each road, landing or skid trail, drainage control systems or stabilization shall be provided and maintained to control water flow.

4. Unless otherwise stipulated, all roads, main skid trails, landings and sawmill sites will be stabilized. Temporary culverts will be removed, water bars installed where necessary, ruts filled or graded out and gutters cleaned.

5. Where required for erosion control or where desirable from a wildlife stand point, major skid roads, landings and/or sawmill sites will be limed, fertilized and seeded with an appropriate mixture of grass and legumes.

III. AESTHETIC CONSIDERATIONS

1. Border Strips:

   a) Within approximately 100 feet of any automobile road, recreation trail or other recreation area, or boundary line in proximity to any dwelling, harvesting of trees will be partial cuttings. Not more than 50% of the merchantable volume should be removed except in salvage operations, to open up scenic vistas, or in forestry demonstration areas. In high-visibility areas, it will be desirable to create uneven-age stands to provide change and variety in scenery.

   b) Special attention will be given to leaving unique tree specimens, flowering shrubs and trees, or those species that have value as food producers or den sites for birds and wildlife.

   c) Brush Control: Undesirable sprout growth or brush should be controlled using approved herbicide treatments. Chemicals used in performing this practice must carry a Federal registration and be applied strictly in accordance with authorized uses, label directions, and Federal and State regulations.

   d) Special consideration shall be given to those Border strips in the following situations:

      (1) Screen clear-cuts, shelterwood cuttings or other heavy cuts that would be deleterious to the landscape aesthetics.

      (2) Screen yarding and loading areas. Debris removal or control is especially important in these locations.

2. Slash:

   a) No slash will be left within 25 feet of any automobile road, established recreation trail, pond, lake or stream.

   b) Within the remaining width or a border strip, all slash will be chipped or lopped and scattered so that it does not exceed four feet in height.

   c) On all other harvest areas, slash, severely bent, or broken trees shall be dropped and/or lopped to a height not to exceed six feet.

IV. HARVEST METHODS

Because of the wide variation in forest types, stand size classes, stocking levels and timber volumes which exist in Connecticut woodlands, there are a variety of methods that can be used either singly or in combination in harvesting and reforestation to meet the stated purpose. These methods include clear-cutting with natural reproduction; direct seeding or planting; seed-tree cutting; selection curring, including diameter limit harvesting, shelterwood cutting, and such other methods as shall be consistent with good forestry practice.

Although even-age management is an accepted silvicultural practice, particularly with hardwood species, its use should be practiced judiciously. A clear-cut area presents a severe visual impact to those unfamiliar with this harvest method. Therefore, clear-cutting will have the following restrictions:

1. Maximum of 5 acres in size.
2. Irregular in shape - avoid linear cutting bounds.
3. Soften edges by partial cutting within 50-100 feet of clear-cut boundaries.
4. Screen clear-cut areas with border strips along roads, trails or other areas of heavy public use.
5. Leave ridge tops uncut - these areas are the most visible.
6. In most cases, even-aged management may be accomplished through shelterwood cuttings rather than clear-cutting.

V. WILDLIFE CONSIDERATIONS

Virtually any cutting in forested areas will provide wildlife benefits. Emphasis will be placed on creating the maximum edge effect, and maintaining as much browse and cover as possible, consistent with over-all management goals.

VI. REGENERATION

Harvest procedures, properly applied and executed, should provide for adequate tree reproduction. However, there will be instances where regeneration may be deficient or undesirable tree species. In these cases, steps should be taken to provide the desired stocking.

VII. FIRE CONTROL CONSIDERATIONS

Access roads and fire lanes will be left clear of slash when a cutting job is completed. Designated roads will be graded so as to be passable by fire suppression equipment.

Where access road construction is included in a harvest operation, considerations should be given to construction of loading docks and fire water-holes at strategic locations.

Adapted from: Lyme Zoning and Subdivision Regulations; Town of Lyme, Connecticut. July 1974.

Appendix D

SUGGESTED TIMBER HARVESTING GUIDELINES

The following passages are taken from "Timber Harvesting Guidelines" 1979 by the Wood Producers Association of Connecticut. The principles set forth in that publication are aimed at protecting the forest ecosystem from thoughtless timber harvesting practices that may lower environmental quality in both the long and short run.

HARVESTING METHODS

Connecticut is blessed with a great diversity of timber species, age classes, and site characteristics. No definite rule or law can be established. Only common sense and general guidelines can be followed when a logger enters the forest.

1) A timber stand should be marked by a qualified person prior to any logging. The volume should be tallied using approved volume tables. A written contract should be signed by the logger and landowner to protect both parties. The International ¼-inch rule is standard in Connecticut.

2) The residual stand of timber must be protected against logging damage: butt scars, broken tops, broken limbs, uprooting trees, etc.

3) Thought must be given to the ultimate necessity of replacing old forests with new ones. In Connecticut an adequate stocking of the desirable species should be established before removing the residual stand. It is thus necessary to retain some healthy, dominant trees of desirable species, growth rate, and desirable form as a seed source.

4) Stump height must be kept to a minimum. Remember that an inch on the butt is worth a foot in the top!

5) Take all of the merchantable section of the bole, even though it may require a little extra effort. A neat job, utilizing the timber resource to the maximum is profitable and will aid in getting future logging jobs.

LOGGING ROADS AND SKID TRAILS

Logging roads and skid trails are prime areas for erosion and sedimentation if they are not properly planned. Most of the real environmental problems, in relation to logging and water quality, come from these areas of soil disturbance.

1) Before starting any logging operation, look over the logging chance so that skid trails and logging roads can be properly planned.

2) Avoid making a skid trail directly up a hill as this will result in excessive channelization and erosion. Use an alternate route, if available.

3) Grades should be kept below 10-percent. For very short distances grades of 15 to 20-percent can be used. (NOTE: a 10-percent grade is one that has an elevation change of 10 feet for each 100 feet of horizontal distance.)

4) Road surface diversions, such as water bars and open top culverts, should be placed at distances commensurate with the road grade. Recommended spacing is:

Road grade (%)	Spacing (Feet) *
2 - 5	300 - 500
6 - 10	200 - 300
11 - 15	100 - 200
16 - 20	100 - —

5) Logging roads and skid trails should be "put-to-rest" after the logging operation is completed. Its access should be prevented by a barrier at its entrance. Water bars should be repaired so that proper road drainage can be obtained while the vegetation is reestablishing itself on the road. Seeding of the logging roads and skid trails is recommended both for aesthetics and for detering soil erosion on the roadways.

6) Refer to the following publications for details in the proper construction and maintenance of skid trails and logging roads.

* *Haussman & Pruett. 1973. Permanent Logging Roads for Better Woodlot Management. USDA. State & Private Forestry, Upper Darby, PA. 45 pp.*

Kochenderfer. 1970. Erosion Control on Logging Roads in the Appalachians. USDA. N.E. Forest Experiment Station, Upper Darby, PA. 28 pp.

Society of American Foresters. Forestry Handbook. Chapter 18.

YARDING AND LANDING AREAS

These areas are some of the most likely places to cause an undesirable effect on water quality. Th · large amount of activity near these areas will cause soil and ve ;etation disturbances and thus special precautions must be taken.

1) Locate yarding areas well away from streams.
2) Keep the area as small as possible.
3) Remove debris and waste oil daily.
4) Blade the area after it has served its purpose.
5) Seed the area when the logging chance is completed.
6) Dispose of cull material in such a way as to be aesthetically pleasing to the eye.

WETLAND AND STREAM PROTECTION

Legislation in past years has focused on wetlands, and their value and protection. Operations in these wetlands and streams should be handled carefully so that problems will not result in the future. A logging operation well handled around wetlands and streams is a credit to a good logger.

1) Near streams only a portion of the timber volume should be harvested. This harvested volume will vary in individual cases, but generally 50-percent of the volume should be left to guarantee protection of the stream to provide shade and a filter strip. Trees growing in wetlands have a shallow root system and can suffer windthrow if a sufficient residual volume is not retained.
2) Avoid felling trees into streams.
3) Remove tops and limbs in streams.
4) Debris which finds its way into streams should be removed promptly.
5) Stream crossings, when necessary, should be made at right angles to the stream, and where banks are low and bottom is rock or compacted gravel.
6) Temporary structures used to cross wetlands and streams should be removed after their use has ended.
7) Seeding of disturbed areas near streams is in order. Small amounts of grass seed judiciously placed can make a big difference in a disturbed area. Backblade the area when operations are completed and then apply seed.
8) Never leave litter near streams and never change the crankcase or hydraulic oil near these areas.
9) Permits may be required when logging near wetlands or streams.

AESTHETIC CONSIDERATIONS

Aesthetic considerations are absolutely necessary in regard to p iblic relations. Logging operations by the competent logger will only be permitted as long as the general public allows them to take place on public and private lands. The right to conduct logging operations can be severely restricted if poor logging practices instigate legislation which can complicate all logging operations; good and poor alike. Neat-looking logging areas can go a long way in persuading the public in accepting timber harvesting.

1) Within 100 feet of all roadways, a sufficient volume of timber should be retained to act as a screen between the roadway and the harvesting operation.

2) Slash will be lopped or chipped within this area. The slash should not be of a height greater than 4 to 6 feet.

3) Within 50 feet of the roadway all slash will be removed completely.

4) Damage to the residual stand must be minimized. Damaged trees should be removed.

5) Noise and truck traffic should be kept in check near houses and populated areas.

FIRE PREVENTION

Extreme care must be exercised if cutting operations must be conducted during high fire danger periods, and at times must be halted in order to prevent a forest fire. A fire can destroy not only the forest and timber within it, but also equipment and lives.

- 1) Be especially careful with cigarettes and matches during high fire danger periods.
- 2) Care must be exercised when operating chain saws during these times.
- 3) Carry fire extinguishers on all vehicles.
- 4) Have readily available, a shovel, fire rake, and "Indian" tank to provide for a first line of attack in case of forest fire.
- 5) Have spark arrestors installed and operable on all equipment.

About the Team

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state, and regional agencies. Specialists on the Team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, archeologists, recreation specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area.

The Team is available as a public service at no cost to Connecticut towns.

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, sanitary landfills, commercial and industrial developments, sand and gravel operations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision-making. This is done through identifying the natural resource base of the project site and highlighting opportunities and limitations for the proposed land use.

REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected officials of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the Chairman of your local Soil and Water Conservation District. This request letter should include a summary of the proposed project, a location map of the project site, written permission from the landowner allowing the Team to enter the property for purposes of review, and a statement identifying the specific areas of concern the Team should address. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information regarding the Environmental Review Team, please contact Jeanne Shelburn (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360.